



Farm Financial Standards Council

Promoting Uniformity and Integrity in Financial Reporting and Analysis

Management Accounting Guidelines

For Agricultural Producers

January 2008

Recommendations of the Farm Financial Standards Council



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Introduction

Management Accounting Guidelines for Agricultural Producers are recommendations of the Farm Financial Standards Council. In addition to this publication, the Farm Financial Standards Council has developed and maintains a companion publication—*Financial Guidelines for Agricultural Producers*.

Management Accounting Guidelines for Agricultural Producers are intended to support and extend the work already initiated by the National Pork Producers Council, the National Corn Growers Association, the United Soybean Board, and the National Cattlemen's Beef Association in providing guidance and support to agricultural producers and their service providers interested in modifying and enhancing their internal accounting systems to provide reporting and analysis consistent with traditional management accounting methodologies. The focus of this document is multi-commodity in nature, and it attempts to provide a strong linkage between internally focused information and analysis for management and the requisite generation of externally focused financial information generated for lenders, owners, and other stakeholders.

Management Accounting Guidelines for Agricultural Producers have been developed in response to the ever increasing need of agricultural producers for consistent, reliable, and accurate management information systems to support day-to-day production decisions. While others may have a peripheral interest in these *Management Accounting Guidelines for Agricultural Producers*, agricultural producers would be the primary users—that use being for internal decision making.

Management Accounting Guidelines for Agricultural Producers should be viewed as a resource document. They should not be viewed as a rigid, inflexible set of accounting systems or procedures that should be implemented by all agricultural producers. Agricultural producers have varying needs for management information depending on the variety and diversity of agricultural enterprises and asset ownership/control. While farming operations may be similar, it is unlikely that any two operations will be *exactly* the same. Each manager must make his/her own determination as to the management information needed and how best to develop that information.

As with the guidelines and concepts found in *Financial Guidelines for Agricultural Producers*, users of management accounting systems must consider the availability of information; the cost and benefit associated with gathering and analyzing additional increments of information; and the amount of information which is necessary to make a specific decision, financial or otherwise, in a sound manner; and the most cost effective way to acquire needed information, which isn't always going to involve accounting.

For convenience throughout these *Management Accounting Guidelines for Agricultural Producers*, the terms "farm" and "farmer" will be used generically to refer to all types of agricultural operations/producers, regardless of whether a beef cattle ranch/rancher, a dairy farm/dairyman, apple orchard/orchardist, etc. Masculine pronouns will be used when referring to the singular. Also, the Farm Financial Standards Council will be referred to simply by the acronym—FFSC.

Structure of the Farm Financial Standards Council

The Mission of the FFSC is to provide education and a national forum to facilitate the development, review, communication, and promotion of uniformity and integrity in both financial reporting and the analytical techniques useful for effective and realistic measurement of the financial position and financial performance of agricultural producers.

The FFSC began as an *ad hoc* gathering of people in January 1989 and was incorporated on March 8, 1993, as a Nebraska non-profit corporation named the Farm Financial Standards Task Force. Finally, on November 12, 1994, the name was changed to Farm Financial Standards Council to more appropriately reflect a permanent organization.

The FFSC is governed by a Board of Directors, each of whom is elected to serve a three-year term. The officers consist of a President, Vice President, and Secretary-Treasurer, each of whom is elected to serve a one-year term. Directors and officers are selected from among interested participants active in the development of Council recommendations or those who have otherwise demonstrated an interest in and commitment to the Mission of the FFSC.

The FFSC is an independent body made up of individuals serving without pay. In addition to the very considerable volunteer time, many organizations have contributed substantial amounts of money, staff time, and material to sustain the effort of the FFSC. Deserving of special recognition are the substantial cash contributions received from The Farm Foundation in the early years.

Brief Background of the Financial Guidelines for Agricultural Producers

Development of the *Financial Guidelines for Agricultural Producers* began in January 1989 by an *ad hoc* group representing virtually all aspects of agricultural finance. That effort began as the result of the severe stress suffered by agriculture in 1983–87, a period now often referred to as the “Farm Debt Crisis.”

The result of that early effort was publication of the *Financial Guidelines for Agricultural Producers*, first in 1991 and later revised in 1993, 1994, and 1997. *Financial Guidelines for Agricultural Producers* focuses primarily on external financial reporting of the whole agricultural entity and on the financial position and performance of the farm.

The goals expressed in Financial Guidelines for Agricultural Producers are:

1. To establish recommended standards for format and content of [external] financial reports of agricultural producers;
2. To identify certain financial measures (usually ratios) common to all areas of the country and all sectors of agriculture and establish standardized methods of calculating those measures; and
3. To encourage the development of an agricultural financial database (either as a national or a regional effort or as part of one or more systems for standardized performance analysis developed by any commodity group). This goal is essentially “benchmarking” in all of its various forms.

With the passage of time, the lack of consistency in charts of accounts used by producers of different commodities has proven to be a major impediment both (a) to the creation of any agricultural financial database and (b) to the development of standardized systems for the analysis of performance within commodity groups. For instance, a rancher running a cow-calf operation on open range land may consider capturing the cost of crop chemicals as immaterial, whereas a cotton grower would likely consider crop chemicals to be quite material and worthy of careful monitoring as to quantities and costs. However, many cow-calf producers are also raising cotton. The same issues of materiality surface when considering swine production and corn/soybean production and other similar combinations of agricultural enterprises.

Brief History of the Management Accounting Project

Summer Technical Symposium, August 1996. Several presentations on how commodity groups were using the *Financial Guidelines for Agricultural Producers* to benefit their members were concluded with strong urging for the FFSC to develop and disseminate a uniform chart of accounts for agricultural producers.

Annual Meeting, November 1997. The Board of Directors of the FFSC endorsed a recommendation for the FFSC to develop (a) a uniform chart of accounts for agricultural producers (limited to the highest summary level) and (b) management accounting guidelines for agricultural producers, or their commodity groups, interested in developing commodity specific management information systems.

January 1999. An *ad hoc* meeting of national and regional producer commodity group representatives (beef, corn, cotton, soybean, and swine) concluded lengthy discussions by urging the FFSC to expand the *Financial Guidelines for Agricultural Producers* to provide:

1. Uniform Chart of Accounts for Agriculture that would accommodate the whole farm or entity level of accounts and could be expanded by adding levels of detail to accommodate the needs of individual production segments;
2. Detailed line item definitions/descriptions for the Uniform Chart of Accounts for Agriculture;

3. Brief discussion on the concepts and need for management accounting systems and guidelines to aid a producer with implementation of a management information system; and
4. Identification of known challenges to be expected as any producer group begins to develop a commodity-specific management accounting system. Commodity group representatives asked FFSC to provide recommendations for addressing these challenges, if practical to do so.

With major funding from the National Cattlemen's Beef Association, the National Corn Growers Association, the National Pork Producers Council, and the United Soybean Board, the FFSC intensified the efforts to complete development of recommendations for (a) a Uniform Chart of Accounts for Agriculture and (b) guidelines to aid in the development of management accounting systems for agricultural producers. In addition to providing direct funding for the Management Accounting Project of the FFSC, these four commodity groups contributed generously of personnel time and information developed as part of their own efforts to design commodity-specific management accounting systems and benchmarking capability.

Summer Symposium 2002. Exposure Drafts of substantive portions of *Management Accounting Guidelines for Agricultural Producers* were distributed.

The *Management Accounting Guidelines for Agricultural Producers* were not developed as a hasty response to an immediate problem. As the project unfolded, the scope seemed to expand as resolution to one issue led to other issues that needed to be resolved. As with all recommendations of the FFSC, the objective has been to find a common ground for resolving conflicting positions. The various participants have been able to come to consensus only after considerable research and debate. Overriding all considerations has been an unwavering commitment that recommendations of the FFSC must always be theoretically correct and technically sound.

Management Accounting Project Core Concepts

In the early stages of the project, the FFSC identified six "core" concepts that would serve as the fundamental drivers in the development of the *Management Accounting Guidelines for Agricultural Producers*. The concepts remain the foundation for the material in this document. The core concepts are as follows:

1. **Requirement for accrual, cost-based accounting records.** Much of the FFSC's previous work has been focused on providing producers with tools and information that would allow them to develop accrual-adjusted accounting information and utilize it for external reporting and analysis purposes. For this project, however, the need to establish a solid conceptual framework for management accounting in agriculture required that FFSC initially establish guidelines that are based on accounting information that utilizes full accrual accounting and the capture and accumulation of inventory and capital asset information on an actual cost basis.

The impact of adopting this concept is that producers who do not have such accounting systems will have to make a transition to accrual, cost-based accounting records before they can fully implement these recommendations. The transition is not insignificant for many producers. The change is necessary if they desire the improved information they will obtain.

Capturing some of the benefits included in the *Management Accounting Guidelines for Agricultural Producers* may be possible without making the transition to accrual accounting. However, the FFSC has not yet had the resources to develop these tools. Hopefully, future efforts of the FFSC, educators, and service providers will be able to offer further discussion of the benefits of partial adoption.

2. **Responsibility Center approach for information accumulation and reporting will be used.** For management accounting information to be useful, it must be accumulated and reported at some level of detail more than the entire legal entity. The accumulation and reporting methodology that FFSC has adopted for these guidelines is the "Responsibility Center" approach, which is discussed in more detail later in the document. It has similarities to the traditional enterprise level accumulation familiar to many producers but considerably more power and flexibility.

3. **Integration of production factors/measurements into the management accounting framework.** A key component of effective management accounting information is the integration of financial information and production information. Integration of financial and production information allows the user to evaluate costs, expenses, and revenues based on appropriate units of production (acres, bushels, pounds, animals, or other units).
4. **Accumulated core transactional information supplemented with economic concepts and analysis.** Once a framework is established for the consistent accumulation and reporting of transactional information, analysis possibilities using that information, supplemented with information from outside the accounting system, are virtually endless. As FFSC developed these guidelines, the discussions invariably extended into useful types of economic analysis that could be conducted with the data gathered. To provide some control of scope of this initial project, these various types of supplemental analysis (breakeven, partial budgeting, rent versus own, etc.) are not covered in this document, but FFSC recognizes that they are very applicable to today's producer.
5. **Guided by consistency with Generally Accepted Accounting Principles (GAAP), commercial industry practice, multi-commodity applicability, and standardization capabilities.** A key facet of management accounting is that it is driven entirely by internal requirements and objectives – the way information is accumulated and reported can by definition be totally specified by management. However, the accounting system that is accumulating and reporting management accounting information is also being used as the source for external financial reporting, which is governed by industry practice and reporting requirements. Producers may well want to participate in benchmarking exercises that compare performance across numerous operations. These will have a specific set of data accumulation and reporting requirements. Although guided primarily by the need for effective internal reporting and analysis, we also attempted to remain aware that these statements would also be used externally. We have attempted to merge standardization of reporting with industry practice and across multiple commodities. Wherever we felt that usefulness of information was not significantly impaired by remaining consistent with these factors, we attempted to do so.
6. **Accommodation of multiple period production cycles.** Accounting systems are most commonly designed to accommodate monthly and annual reporting cycles, and external reporting requirements generally tend to follow calendar or fiscal years. The biological production processes inherent in all farming operations, however, can range from daily production cycles (milk) to several years (livestock production, perennial crops, etc.). The accumulation and reporting of accounting information for products and services that have production cycles extending beyond the close of the annual reporting cycle create significant challenges that are often not addressed by standard management accounting practice. Recognizing that such lengthy production cycles are a characteristic of many farm operations, we have attempted to specifically address their unique issues as we have developed these guidelines.

Organization of Document

The remainder of this document is organized into eight major sections as follows:

The Need for Understanding Costs contains a discussion of traditional ag accounting systems, an identification of similarities between management accounting based analysis and the traditional enterprise analysis utilized in many agricultural systems, and a discussion of the key drivers that the FFSC believes underscore the importance of adoption of the kinds of data capture and analysis discussed in this document.

Basics of Managerial Accounting contains a discussion of many of the fundamental concepts that serve as the basis for the discipline of management accounting.

Management Accounting Levels of Reporting contains a discussion of the typical information and reporting structure contained in a management accounting system.

Managerial Accounting Issues for Agriculture contains a discussion of a number of ag-related issues that often create questions relating to data capture, classification, and reporting, along with the FFSC's current position on recommended treatment.

Chart of Accounts contains the FFSC's recommendation of a top level data capture structure for a management accounting system, presented in the format of a "zero level" chart of accounts, which could be implemented with alternative chart structures.

A Process for Setting Up Your System contains a high level process to assist those interested in converting their existing agriculture accounting system into one that accommodates the management accounting structure described in this document.

Appendix contains a case study illustrating segment structure and reporting utilizing several software systems currently available to producers.

The Need for Understanding Costs

Basic Logic Model

Today's business environment in agriculture, as in many other industries is increasingly complex and dynamic. Business managers are faced with high levels of uncertainty, rapid obsolescence of assets, technology, products, processes, and increasingly difficult decisions related to improving profitability and asset performance.

Major advances in information technology and communications now provide huge amounts of information for managers to assimilate. They offer a wide variety of sophisticated systems at relatively low cost that can capture, report, and assist with analysis of at least portions of this information.

In today's agricultural environment, farmers and ranchers deal with a number of information sources from which they must select and utilize appropriate data to assist them in the decision making process for their operation. These systems include, but are not limited to, accounting systems, customer feedback, and crop production systems (Figure 1).



Figure 1. Information Systems and Sources

As the businesses for which managers are responsible continue to grow in size, scope, and complexity, it becomes increasingly difficult to process all the information on an *ad hoc* basis. Managers have a strong desire and need to organize much of this information into some type of Management Information System (MIS) in an attempt to provide a structure for the receipt and analysis of all of these disparate sources and levels of information.

This document does not attempt to provide guidance over all of these information components. Our focus is twofold (1) the internal accounting system and the types of information and analysis it can provide as part of the overall MIS, and (2) how the output from production information systems can be meaningfully integrated with accounting information.

Role of the Internal Accounting System in Providing Information

At the core of any MIS lies the internal accounting system – the approach for capturing, storing, and reporting relevant financial information of the business. Internal accounting information is utilized for a wide variety of purposes, which can be represented as essentially a continuum of uses (Figure 2).

Reporting Objectives	Compliance Reporting	External Reporting	Internal Whole Entity Reporting	Segment Reporting
Key Users	IRS Regulatory Bodies	Lenders Owners Potential Investors	Senior Managers Board	Segment Managers Senior Managers

Figure 2. Internal Accounting Information Uses

How businesses accomplish the reporting objectives varies widely. In many farming operations and many small businesses, the objectives of the accounting system are driven primarily by compliance reporting – capturing information necessary to generate tax returns and other compliance-based reports. This information is then supplemented as necessary to satisfy minimal external reporting needs – usually just to the lenders providing financing. Since these businesses are often characterized by a single manager and family owned, the accounting systems generally are not designed to capture information or to generate reporting for internal, management purposes. Managers rely on their own intrinsic knowledge of the operation, and their decision making is focused prospectively rather than on a detailed look at historical performance.

As businesses grow more complex in their scope and structure, the ability of cash-based systems to provide sufficiently useful and accurate information for decision making becomes inadequate. Managers are faced with numerous operating and strategic decisions that have fundamental impact on the future performance of the business. They must have an increasing level of accurate, relevant, and comparable information from the accounting system to assist with those decisions. These demands have two results on the accounting system itself and on those responsible for maintaining the system. First is the need to maintain transactions with sufficient detail so that the information can be summarized and reported in a variety of ways for different purposes. Second is the need to integrate the accounting information with other information systems in the business, especially the production systems for crop and livestock management.

These demands on the accounting system and accounting personnel in an agricultural operation drive many different types of systems and sophistication. However, a fairly common evolutionary path is:

Stage I – Cash-based records, compliance focused. These operations are generally characterized by a single manager/owner and a relatively straightforward production process. Accounting information is tracked and accumulated mainly for preparation of tax returns and provision of basic financial information to lenders. Analysis of new opportunities is based primarily on intrinsic knowledge as well as prospective (future-based) analysis.

Stage II – Cash-based records, external or whole entity focused. These operations are somewhat larger in size and may have a small management team (or may still be single manager/owner). Management has determined that doing basic financial analysis of the entity is important. Financial statements are normally prepared at year-end (and sometimes more often) that provide accrual-adjusted earnings and lend themselves to overall evaluation of return on assets and return on equity. Inventories are usually reported on a market value basis. Analysis of individual enterprises may be conducted with basic expense allocation. Projection capabilities can vary from simple to quite sophisticated.

Stage III – Accrual-based records, external or whole entity focused. This evolution is one driven almost entirely by the needs and requirements of internal management rather than some external factor related to size of business or number of managers. At this stage, management has decided that it wants the ability to generate comprehensive financial information on a basis more often than annually or quarterly. Management also wants the ability to examine individual revenue or expense items on an accrual basis rather than going through the adjustment process of adding cash receipts or expenditures to changes in balance sheet accounts. Further, balance sheet entries are maintained on an ongoing basis within the accounting system. Inventories are still primarily maintained on a market value basis, although cost-based inventories are more common at this stage. At this stage of development, most firms are also attempting to utilize information from both their production and accounting systems in an integrated fashion as part of the ongoing management process.

Stage IV – Accrual based records, segment reporting focused. At this stage of development, businesses are generally characterized as having multiple profit-making ventures, multiple locations, and/or multiple managers. The business is also often characterized by transfer of products from one portion of the business to another (rather than outright sale), thus making the issue of performance measurement more challenging. Finally, businesses at this stage often have individuals or teams responsible for providing support services to others on the farm – be it machinery management and operation, accounting and office support, feed grinding and distribution, for example. These operations are focused on being able to capture cost information at a detailed level and being able to compile and summarize those costs in a meaningful way across the various segments of the business. Cost-based inventory records are routinely utilized, and the integration with production systems is a major priority of the overall management information system.

The accounting system is the principal – and the most credible – quantitative information system in almost every organization. The system should provide information for five broad purposes:

1. Formulating overall strategies and long-range plans, including new product development, major shifts in production methods, and investment in both tangible and intangible assets, and frequently involves special purpose reports.
2. Resource allocation decisions such as product and customer emphasis and pricing. These discussions frequently involve reports on the profitability of products or services, brand categories, customer, distribution channels, and so on.
3. Cost planning and cost control of operations and activities, involving reports on revenues, costs, assets, and the liabilities of divisions, plants, and other areas of responsibility.
4. Performance measurement and evaluation of people, including comparisons of actual results with planned results. It can be based on financial or nonfinancial measures.
5. Meeting external regulatory and legal reporting requirements because regulations and statutes typically prescribe the accounting methods to be followed.

Management accounting measures and reports financial information as well as other types of information that assist managers in fulfilling the goals of the organization (Purposes 1-4). Financial accounting focuses on external reporting that is guided by GAAP (Purpose 5). Cost accounting measures and reports financial and other information related to the organization's acquisition or consumption of resources. It provides information for both management and financial accounting.

Traditional Analysis Approaches

Historically, analytical techniques utilized in agriculture have been driven by a focus on whole entity analysis, since most operations were primarily managed by a single producer and very few operations had multiple managers with specific areas of responsibility. Therefore, it seemed sensible to evaluate the business at the “management” level – in other words the whole farm. As operations grew more sophisticated and operators became more interested in the performance of different sectors of their operations, significant development of analytical approaches were designed to give a producer an understanding of the profitability of the individual “enterprises” of the operation. This so-called “enterprise analysis” included an allocation of all costs of the operation across each major crop or livestock category (i.e., an enterprise). Many universities and service providers provide enterprise budgets (prospective) on an annual basis.

Enterprise analysis commonly incorporates both accounting information and economic data, such as the opportunity cost of unpaid family labor and the opportunity cost of owned land rental in the analysis. Fundamentally, however, enterprise analysis provides an allocation of revenues and costs to various production enterprises.

Enterprise analysis has a number of similarities with the segment based reporting and analysis that is incorporated in these recommendations. However, some significant differences allow users of this segment-based information to take a more detailed look at cost drivers and resource management in an agriculture operation. The differences include:

1. A primary focus on capturing actual cost data for production, thereby allowing managers to focus on actual performance on their operation;
2. An accumulation of costs at levels where they are controllable by management and are directly related to the activities that create them; and
3. An aggregation of costs and revenues at levels of the organization where profitability can be measured in absolute terms and relative to the assets employed to generate those revenues.

This increased level of information and analysis does come at a cost to the organization. Implementation of a segment-based management accounting system requires a more structured process, a greater level of traditional accounting understanding, and often a more customized accounting software system than would be required for the more typical recordkeeping and financial analysis conducted on many agriculture operations. For most producers who have reached a level of complexity in their operations that they would be classified as “commercial” producers, we believe the costs and efforts of implementation will be more than offset by better quality information to make decisions in their business.

The Increased Complexity of Decision Making

Commercial ag operations are today characterized by an increasingly complex set of decisions related to strategic, operational, and financial management. These decisions include:

1. Resource allocation decisions relating to owning or renting key capital assets, including land, buildings, and machinery;
2. Personnel management decisions that require the incorporation of additional managers with specific responsibility for cost management or profit generation in various segments of the farm and the creation of proper systems to evaluate and compensate the performance of those managers;
3. Entry and exit decisions relating to adding enterprises, dropping those with insufficient profitability, and focusing on profitability improvement on existing enterprises with potential for enhanced returns; and
4. Value chain decisions relating to aligning with coordinated chains where some or all of product pricing is based on cost and productivity improvement.

Basics of Managerial Accounting

The concepts underlying managerial accounting are actually quite simple – implementing them successfully, however, can be a significant undertaking. The concepts include the following:

1. To manage costs, one must first organize cost information in a manner that is logical (i.e., associate them with appropriate “cost objects”). This organization requires that costs be correctly classified at the time they are entered into the accounting system. If the entry is done correctly, the rest of the process merely involves accumulation, allocation, and reporting.
2. Cost accumulation and reporting should be done at a level where costs are “controllable” and where management responsibility exists for those costs. Allocating repair costs as an individual line item to various crop enterprises, for example, does not accumulate those costs where they are controllable. Repair costs associated with machinery are controllable at the equipment level, where a manager is making trade-offs regarding purchasing new or used equipment, or making major or minor repairs, etc. The total cost of operating machinery needs to be associated with each of the crops, and that total cost needs to include either the purchase of new/used machinery or the repairs made.
3. Effective cost analysis and management requires the cost information to be organized in a manner that mirrors the key drivers of cost (for example, crop costs are driven primarily by acres, not bushels). This type of organization allows managers to identify and analyze how costs behave at different levels of production or activity.
4. Costs must be effectively matched with revenue in a manner that allows for consistent and accurate measurement of margins and profit. Certain “revenue” items are in fact “cost reducers” rather than core revenue of the operation. Therefore, they should be reflected as a reduction in production cost rather than implying they are part of the overall core sales mix of the entity. The best examples are the sales of breeding stock in a livestock operation (which more accurately reduce the cost of providing breeding livestock rather than increase the sales of the operation), or perhaps custom hire of machinery (which actually reduces the cost of machinery operations on the farm rather than increases overall sales). Unless the operation is actually in the “business” of producing breeding livestock or providing machinery for hire, including these items as revenue can make cost analysis quite difficult.
5. In any business involving manufacture of a product, costs move through the operation in a “flow” – they start as raw materials (the seed and chemicals not yet applied), then move to “work in process” (the growing crop) and finally to “finished goods” (the harvested grain). Tracking these three categories of inventories is a major component of the overall **managerial** accounting process.

While all of the above concepts make logical sense, they are usually totally absent in a typical agricultural accounting system that uses an accrual-adjusted approach for generating management information and financial statements. They are absent because most agricultural operations do not capture and organize information at the level identified above. Rather the tendency is to accumulate all cash disbursements in general account categories (seed, chemicals, expenses) and then perform overall accrual adjustments that include marking inventory to market values to obtain margins and profitability.

Understanding Costs

Several definitional issues are important to the discussion and understanding of costs:

1. **Cost versus Expense.** Although these terms are often used interchangeably, they have different accounting meanings. Cost is the dollar value of resource given up for some product, service or specific purpose. Expense is the dollar value of resource used during a specific accounting period. We incur costs to produce inventory (an asset), and the inventory cost is later expensed as it is sold.
2. **Production Costs and Period Expenses.** This distinction is important in understanding the overall flow of costs through the production process. Production costs are recorded as assets as products are made; they become expenses only when the product is sold. Period expenses are costs of goods and services that are recorded as expenses in the period in which they are consumed. Period expenses do not really “add value” to the product. They are merely associated with maintaining it in saleable form (storage and warehousing expenses), transporting it to the point of sale (marketing expenses), providing overall general administrative support to the business (general and administrative expenses), or providing capital to finance the production process (finance expenses).
3. **Production Costs versus Total Product Costs.** Production costs, as identified above, are recorded as assets as a product is being manufactured (or grown). They also, in most accounting systems, correspond directly to those costs that are capitalized as inventory costs until a product is sold. The concept of “Total Product Costs,” however, is a broader term. Although charges associated with sales, marketing, and transportation to market points are in fact period expenses, more and more companies are finding that these expenses are important for decision making purposes *at the product level*. Examples include the relatively high cost of warranty and customer support for software firms (which are deemed sales and marketing expenses) but can often dwarf the actual cost of manufacturing the software itself. A related example is the significant research and development expenses that are incurred in developing many new products in the medical or technology fields. Associating these period expenses with individual products allows for much more informed decisions regarding product pricing, new product development, and overall decisions to continue producing particular products. For our purposes, the terms “Total Product Costs” and “Total Unit Costs” are essentially synonymous: they refer to the accumulation and reporting of not only production costs but other period expenses that can be reasonably allocated to products for analysis purposes.
4. **Direct Costs versus Indirect Costs.** Direct costs are those that are directly traceable to a particular cost object. They are coded directly to a cost or profit center. Indirect costs are those costs that are accumulated in one cost pool and then “allocated” to another cost or profit center. For example, costs associated with machinery activity would be directly coded to a machinery cost center (depreciation, repairs, fuel, etc.). Then the entire balance in the machinery cost center would be allocated to production cost centers (wheat and peas, for example). The allocation would show up as an indirect cost on the corn and soybean cost center report.
5. **Variable versus Fixed Costs.** Variable costs vary directly with the amount of product created. Fixed costs are incurred regardless of the volume produced. As an example, the cost of feed is a variable cost in a livestock operation. It increases with the number of animals on feed or with the length of time in the feedlot. Liability insurance is a fixed cost. It does not vary with any production factor. The important distinction to understand is that both production costs and period expenses can have variable and fixed components – as can direct and indirect costs. Variable versus fixed is a description of the particular costs behavior; it is not an example of a type of cost.

Concept of Responsibility Centers

Overview

The process of managing an organization is often described as a cycle of planning, performing, measuring, and adjusting the organization's operations. This management process is applied by those responsible for the organization. Thus, an effective measurement strategy to support this management process involves some level of reporting on the performance of those responsible for the organization. The idea of responsibility accounting is to tailor the accumulation of costs within an organization to be consistent with the various levels of management responsibility. This idea is based on the premise that managers should be held accountable for their performance as determined by the performance of the people they manage and the resources they control.

These manageable segments of the business may not be under the responsibility of the same manager and consequently thought of as measuring the performance of individual managers. They are in reality about obtaining knowledge of those segments of the business on which management wishes to focus its attention. The segments created in this process are often referred to as responsibility centers. Responsibility centers are created according to who management sees as responsible for a particular part of the business.

These responsibility centers must be structured to provide management with information appropriate to the decisions that must be made. The information that is accumulated through these responsibility centers must be reported to management in a manner consistent with the intended use of the resulting information.

Types of Responsibility Centers

Responsibility centers are typically classified in a variety of ways. The objectives of management and the nature of each particular segment determine the type of responsibility center appropriate for measuring the performance of various parts of the business.

For example, a producer may have a shop with the objective of providing efficient and effective repair and maintenance services to other segments of the business; particularly to equipment, transportation, or storage segments. The shop is limited to a responsibility to control costs while providing the requisite level of service. The shop responsibility center is not intended to produce revenue or generate a profit. In contrast to this focus, the producer may have a feedlot to finish cattle for market. This center has responsibility to create revenue through the sale of its output, to control the costs incurred in creating the output, and to generate a profit by maximizing the excess of revenue over the costs incurred.

Responsibility centers are frequently classified as:

- Cost centers
- Revenue centers
- Profit centers
- Investment centers

Figure 3 illustrates the potential relationship among these responsibility centers.

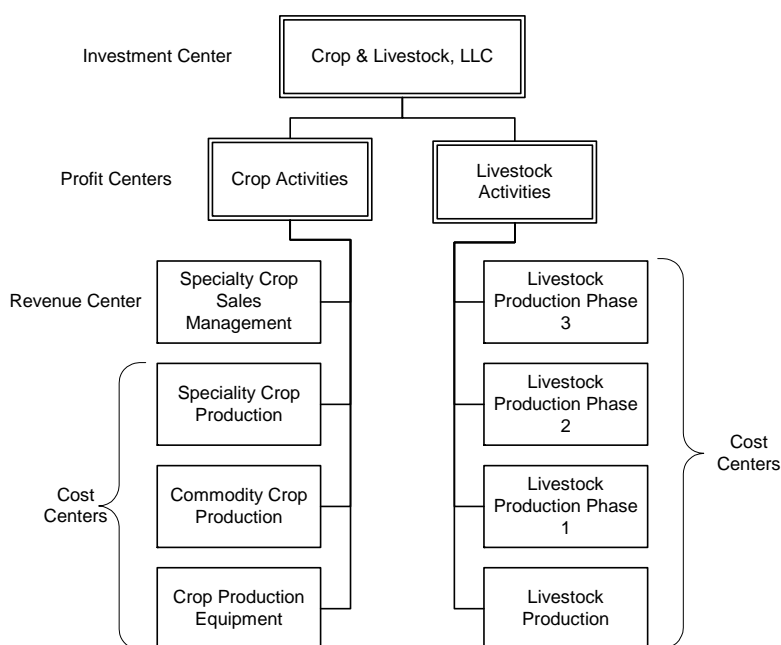


Figure 3. Relationship among Responsibility Centers

Cost Centers

A cost center is a manageable segment that, while fulfilling its role in the organization, is principally responsible for the control of costs. Cost centers typically control inputs to the business' production and service activities and generally have no control over sales or the generation of revenue. Cost centers are the most common type of responsibility center. Figure 3 illustrates a likely relationship of cost centers to other responsibility centers in the organization.

The association of appropriate costs with cost centers is a crucial task of the managerial accounting process. The first step in controlling costs is knowledge of where within the organization the cost was incurred and which segment of the business has responsibility for the cost. A number of strategies can be employed in this association process. These strategies may consider such aspects of costs as:

- Controllability
- Direct or indirect cost
- Product or period cost
- Variable or fixed cost

Further discussion of cost association strategies, their applicability and potential inconsistencies is presented later in this document.

Revenue Centers

A revenue center is a responsibility center that has as its primary goal the creation of revenue. Revenue centers would typically have little control over the cost of the goods sold and would have significant influence over sales and marketing strategies and related pricing decisions. Revenue centers are rarely found in commodity focused production agriculture. They are more likely to be found where specialty production or services with multiple channels of distribution exist and management wishes to measure the performance of the portion of the business that focuses on these activities.

Profit Centers

A profit center is a segment of the business that embraces both costs and revenues. Profit centers typically encompass significant areas of activity within the business and are a major reflection of management's strategy to achieve its overall profit goals. A profit center facilitates management's need to measure the performance of these significant activities of the business. In Figure 3 the crop and livestock activity comprise separate profit centers within the business. In some sense these enterprises may be characterized as separate businesses within the overall business.

As organizations grow in size and complexity different individuals are frequently responsible for different profit centers. However, in production agriculture, we frequently see management structures where a single individual is responsible for the performance of multiple profit centers. Even though a manager may find it difficult to think in terms of measuring his individual performance, it remains essential that such a manager thoroughly understand the relative performance of these profit-focused, manageable segments of the business.

Investment Centers

An investment center is a segment in which the overall focus of performance measurement is the profitability or return on capital invested. If management is faced with the task of assessing the relative performance of several profit centers, looking at only the profitability levels of each may not be appropriate. A more accurate assessment may result by looking at the profitability of each profit center relative to the assets or resources available to each manageable segment.

In performing an assessment of earnings relative to resources employed, management must also consider how to measure the resources employed. For example, management may use total gross assets, total net assets, total net assets employed (perhaps adjusting for unused or long range capacity), stockholders equity, or such measures as working capital, only fixed asset measures, or other investment bases.

An investment center focus also facilitates the comparison of business segments that are quite different in size. Figure 3 illustrates Crop & Livestock, LLC, as an investment center. The owners of Crop & Livestock may have other business interests. By looking at Crop & Livestock, LLC as an investment center, they are able to compare these different investments.

Conclusion

Many production agriculture businesses may be considered small by common business size measures. These businesses may be staffed with a limited number or often a single manager. They may at the same time be very complex with several manageable segments. All but the smallest and simplest organizations can likely improve overall performance by focusing on segments of their business. This opportunity is facilitated by the establishment of an appropriate mix of responsibility centers combined with a well designed set of segment focused performance reports and related information.

Modeling the Production Flow

The cost and profit centers that are established for a business are typically configured in a manner consistent with the physical production processes and activities of the business. The managerial accounting system models and tracks the flow of resources used in the business from the very beginning of operations through the sale of the finished product and any post sale activity that may occur.

The creation of such a system requires a comprehensive understanding of the business, its processes and activities, and the manner in which management does (or wishes to) view the organization and make the decisions essential to fulfilling its responsibility. The extensive knowledge required and the many details to be addressed in such a design specification effort go beyond the scope of this publication. However, this section does provide an overview of the issues that should be addressed and their role in creating an effective system.

Cost Identification

What is to be costed must be clearly understood. While a single “thing” may sound as if it is costed and management may wish to know the ultimate cost of a finished product, many processes, phases, production stages, and activities (both production and non-production as well as operational and capital in nature) will be measured along the way. The mix of these cost objects is the core component of the system. The system is going to accumulate or pool costs for each of these objects.

This configuration of cost accumulation and cost pools determines the level of complexity and sets boundaries around the kinds of data that must be accumulated to allow the system to function effectively. If management does not want or need the information or the cost pool is not otherwise essential for the overall flow of transactions, it should not be incorporated into the system. **Managerial accounting systems tend by their very nature to become complex. Keeping the structure as simple as possible is important.**

For example, a crop producer produces wheat along with other crops. This producer has the equipment necessary to produce the wheat and the other crops. Some of this equipment is suitable for use on multiple crops, and some is specific to a single crop. This limited use is particularly common in harvesting equipment. Furthermore, the producer raises both winter and spring wheat. Does this producer's managerial accounting system pool all equipment costs together or separate them into smaller more specialized pools? Does this system have a separate cost pool for winter and spring wheat or a single cost pool for both?

Many such possibilities and configuration alternatives must be considered in specifying an appropriate managerial accounting system. Understanding how management intends to make decisions, what its underlying rationale (its intent for this part of the business) is for each segment, how it wants the responsible manager to behave, and the organization's capacity to collect and communicate relevant data are important considerations in the system specification process.

Cost Capture

In addition to determining the cost objects on which to focus the system, management must consider what detailed transaction information should be captured to have the most effective system. Determining the transaction information will include both financial and production activity. Both these types of information must be effectively integrated to permit the reporting of financial activity relative to an appropriate measure of production. Merging the financial and production information requires extensive coordination of information capture strategies with production people and the development of effective processes. Organizational discipline and understanding the value and importance of accurate and timely data are crucial in the cost capture processes.

The specification of the chart of accounts is a significant part of the cost capture strategy. The chart of accounts will largely control the level of line item detail available in the many segment reports. The cost capture strategy must also include consideration of appropriate quantities and production year information to accumulate along with the financial aspects of transactions. It is also important to avoid redundant segment information in the chart of accounts. A single seed cost account when associated with the various crop production cost centers is simpler than a seed cost account for each crop produced and avoids duplication.

The “Understanding Costs” section earlier in this document refers to the concept of direct and indirect costs. The cost capture activity is where this distinction is made. Each transaction must be considered in light of the segment to which it will be directly charged. One of the challenges in the cost capture process is to balance the coding effort (breaking a single invoice into many separate entries associated with several different segments) with processing efficiency (coding a transaction into an appropriate cost center and allowing the subsequently described allocation process to effectively move the related costs through the appropriate production segments). The extent of this challenge is influenced by the original configuration of the system.

For example, the crop producer raised multiple crops and had an appropriate line of equipment. This equipment included some items that benefited all crop production and some that was specific to the production of a single crop. The producer receives an invoice for parts and service on a variety of equipment including work on the header used only to harvest corn.

The original specification of the cost centers provides some guidance as to how this transaction gets handled. Does a single equipment cost center or multiple equipment cost centers focus on Harvest Equipment, General Equipment, and Transportation Equipment? Does the system configuration and cost capture process contemplate coding corn head repair costs to an equipment cost center or to a repairs and maintenance account in the corn production cost center? Either approach will permit an accurate determination of corn production costs. However, one approach permits a more comprehensive cost accumulation (and presumably focus of management attention) on the group of equipment assets as a whole rather than spreading this information through several cost centers. This challenge is typical of one faced in configuring the cost object structure and implementing it in a cost capture process.

Allocation to Cost Object

Once the direct costs have been properly captured in the appropriate cost centers, the system can begin to produce some valuable management information. At a minimum, the system can provide direct production cost information by cost center (for example, by production stage, by support activity, or by commodity). However, having only the direct costs leaves a number of information gaps. Having the direct production costs of a particular crop may provide information regarding the usual inputs of seed, chemicals, and fertilizer, but it may leave out the potentially significant costs associated with machinery and equipment, labor, and other production overhead items.

These latter production costs may very well be directly accumulated in another cost center. To include them in a more complete determination of costs, we allocate costs from one segment to another in a logical, systematic fashion to ultimately provide a more complete cost picture and set of management information. Costs and expenses are allocated for a variety of reasons including to

1. Support resource allocation decisions,
2. Motivate and influence the behavior of managers and employees,
3. Meet legal and compliance requirements, and
4. Determine the cost of products and services for both.
 - Contract purposes, and
 - Pricing purposes.

The purpose of the allocation will determine how the costs will be designated and the level of precision needed in the allocation process. Of course to have the greatest value, considerations of these issues should be applied while designing the managerial accounting system. A key component of the allocation process is to determine the allocation criteria. This process is sometimes referred to as determining the cost or allocation driver.

The system designer should carefully consider the system specification phase to avoid creating cost center relationships that depend on allocation criteria that cannot be practically and reliably obtained. The commodity organizations that worked on integrating production and financial standards in the late 1990's created tables of suggested allocation criteria to be applied in many of the common production situations that producers are likely to experience. Common allocation criteria may be as simple as acres or tons fed or more complex such as head days (number of days on feed times the number of head) or trip acres (number of trips times the number of acres covered).

Allocation criteria are commonly based on an objective measure of the benefit one segment receives from another. Other criteria that may be used to determine allocation criteria include 1) cause and effect relationships, 2) an assessment of what is fair, and 3) the ability of various segments to bear the allocated costs. The most basic guidance on choosing allocation criteria is to select an allocation base that best achieves the purpose of the allocation.

The sequence and timing of allocations must be considered when establishing the allocation processes. Allocations must be performed in the order in which the costs flow to avoid moving the costs through the system before other costs being allocated to that segment have arrived at the allocated cost pool. Some cost pools may be allocated monthly while others may be allocated at the conclusion of some production phase or as the inventory status of the product changes.

One of the primary results of the allocation process is the final determination of costs associated with production output or some measure of cost per unit. This cost per unit may be at an interim production stage (e.g., weaned pigs) or at a final production stage (e.g., finished pigs).

Charge to Revenue

An effort to illustrate the managerial accounting transaction flow is essentially an effort to model the production process. Identifying the transactions created as a result of the production process and their relationship is the basis of such a transaction flow model. Because the production process is complex, the transaction flow process (and related costs to operate and maintain) must be balanced with the knowledge needs of managers in measuring performance and making monitoring and control decisions.

A transaction flow illustration presumes:

- Manageable segments are specified,
- Support/allocation relationships are understood, and
- Allocation sequence and criteria are identified.

Inherent in creating this detailed structure is an understanding of management's cost objects and the types of costs that will be included in the measurement process.

Note that throughout the discussion the reference to cost refers to actual or historical cost as opposed to economic or opportunity cost. This is not to imply that economic costs are irrelevant in managerial performance analysis. Rather, they are essential for certain decisions. However, economic type costs are generally not placed within a transaction oriented accounting system. Thus, they do not appear within a simple transaction flow illustration.

In the following transaction flow (Figure 4), all material transactions are based on an accrual accounting process. Thus, the issue of when payment is made for acquired resources or ownership is recognized on the financial records conforms to conventional accounting recognition principles.

1. Materials used in the production process are purchased.
2. Materials immediately placed into production generally result in a change in their fundamental nature. However, in many cases, raw materials acquired for production purposes are initially placed in storage for use at a later time. The result of this flow is to create a raw material inventory asset on the balance sheet of the business.
3. Labor is purchased via compensation to employees.
4. Other resources such as various contract services, insurance products, utilities, and the other non-labor and non-materials items required to operate a business are purchased in the normal course of business.
5. As the acquired labor and resources are used, a determination must be made as to whether they are part of the production process of the business or used in the administration, marketing, and sales activities of the business.

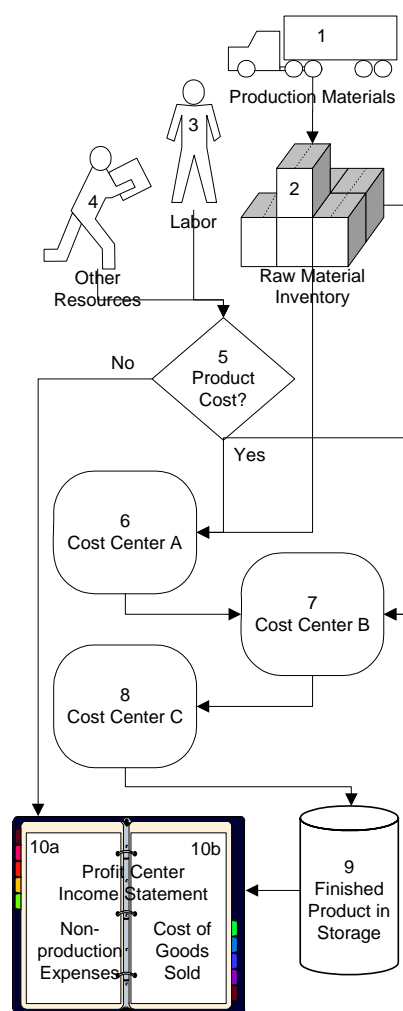


Figure 4. Typical Transaction Flow

If the latter reflects their use, they are treated as a period expense and charged directly to the income statement. Their path to the income statement may take them through a non-production responsibility center such as general and administration. Irrespective of whether they become part of a responsibility center, they do not become part of the inventory assets of the company.

If the acquired resources do become part of the production process they will be charged to the appropriate production oriented responsibility center. In this illustration, they are first charged to cost center a.

6. The introduction of acquired labor and other resources constitutes a change in the characterization of the resources to a work in process (WIP) inventory asset. A similar re-characterization of the raw material inventory occurs as it also becomes WIP when put into the production process. Thus, the partially completed product leaving cost centers A and B will be characterized as WIP.

This change to WIP begins the process of accumulating appropriate cost pools represented by each of the responsibility centers that are designed to assemble costs with a similar purpose in a common segment to increase management's knowledge of these segments.

7. As the production process continues, accumulated costs are allocated from one cost center to another in the designed sequence that parallels the production process flow. The establishment of appropriate allocation criteria and timing is an essential part of the managerial accounting system specification.

Some labor, raw materials, and other purchased resources may be introduced to these additional responsibility centers directly and not arrive via the allocation process. These costs are commonly characterized as "direct costs" in that they are directly related to the particular segment rather than arriving at that destination indirectly (Figure 4 additional raw materials, labor, and other resources flowing directly to Cost Center B). The business continues to accumulate its investment in WIP inventory.

8. The allocation process continues to model the production process. The general design moves the dollars in a time line along with the movement of product through the production phases and, as the product continues, to accumulate costs from those responsibility centers that support the production process. The business continues to accumulate its investment in WIP inventory.
9. At some point the production process ends. The product is placed in storage (even if for a very short period of time) pending sale and delivery to the customer. At this time, the accumulated costs can be assembled and a total cost of production determined. This total cost is typically re-characterized as finished goods inventory on the balance sheet of the business.
- 10a. Those expenses incurred in the non-production aspects of the business are treated as period expenses. They flow to a profit center income statement of the business within the current accounting cycle. They do not constitute an asset of the business and, therefore, do not remain on the balance sheet. Rather they are presented as current period expenses. These expenses may flow through appropriate responsibility centers on their way to the profit center to facilitate the management process.
- 10b. As the finished product is sold, it ceases to be an asset of the business and is removed from the balance sheet. The resulting dollars flow to the profit center income statement as cost of goods sold.

Types of Costs and Expenses

To complete the discussion of the cost identification process, identifying all of the costs and expenses that will be captured within a traditional accounting system is useful.

Production Costs include all costs associated with the production process. They include both direct costs (costs that can be directly allocated to a particular cost object) and indirect costs (costs related to the production process but for resources that support more than one cost object). By definition, production costs in total represent the cost basis of inventory items in most accounting systems.

Within the context of responsibility center terminology, production costs are accumulated in production cost centers and support operations cost centers. The allocation of support operations cost centers is the process by which indirect costs are created.

For example, a grain producer is growing corn and soybeans and has chosen to establish three cost centers in his accounting system – a corn production cost center, a soybean production cost center, and an equipment support cost center. All production costs that do not relate to the equipment cost center are captured directly in the corn and soybean cost centers as direct costs. The costs associated with equipment are captured directly in the equipment cost center and then allocated to the corn and soybean cost centers using some allocation method (acres planted, trips made, etc.).

Sales, Marketing, and Transportation Expenses include those expenses associated with transforming the products in inventory ready for sale to a completed sale. It is sometimes shown on an income statement as merely sales expense or separately as sales expense and delivery expense. It can include a number of categories:

- Sales expenses based on transactions, such as commodity check-off expenses, broker commissions, or yardage charges at the sale barn;
- Marketing expenses of a more general nature, such as subscriptions to market advisory services or development of sales catalogs;
- Storage/warehousing expenses incurred while products were being stored until actual sales took place; and
- Transportation expenses related to the *delivery* of products. Transportation costs related to inbound freight or for movement of animals or grain prior to it being “ready for sale” would be categorized as production costs.

All these items are called “expenses” rather than “costs” because they are, in fact, period expenses and are recognized in the period in which they are incurred. They are not included in inventory.

General and Administrative Expenses are costs incurred by headquarters staff or other central units, as contrasted with costs are incurred in production, marketing, or other operational units. In agriculture, we can think of these items as not directly related to production, but nonetheless related to the operation of the business. Examples include professional fees, commercial liability insurance, general management salaries, and office and accounting expenses. General and accounting expenses are also considered period expenses and are expensed as they are incurred. They are not included in inventory costs.

Other Income/Expense includes, as a major component, interest expense on operating and term loans utilized to finance the business. It also often includes early pay discounts or late payment charges, because those revenues and expenses are related to the financing the business. Finally, this category includes any interest income received on surplus cash invested by the business. Generally, finance expense is treated as a period cost and expensed as incurred. Although some argue for capitalizing the portion of inventory cost related to the production process, it is generally not done and is not recommended by the FFSC.

Income Tax Expense includes income tax expense related to federal, state, and/or local taxes on income before tax reported in a particular period. It normally contains both the amount of tax currently owed on the income reported as well as any tax deferred to future periods because of differences between tax and book reporting of income. Income tax expense is also a period expense and is expensed when incurred.

Inventories and Managerial Accounting

Inventory Accounting – New to Agriculture

The most fundamental change included in these recommendations for most producers will be how inventory values are calculated within the system, and ultimately, how they might be reported within the managerial accounting system and for external users. Throughout these guidelines, we assume that the focus is on accumulating the **cost** of inventory production. For financial reporting purposes, inventories may ultimately be reported on a market basis or a lower of cost or market basis, both approaches are consistent with GAAP for certain commodities. However, prior to that external financial statement preparation, the internal accounting system will be accumulating the cost of production inventories.

While conceptually the process of accumulating inventory production costs seems straightforward, the issues associated with inventory costing can be quite confusing. This confusion arises because we need to understand several issues surrounding how inventory cost information will be used, and those nuances have a significant impact on the process of accumulating cost.

First, however, acknowledging the considerable differences between the way inventories have traditionally been handled in agriculture and the way they are handled in manufacturing operations (and in these guidelines) is important. In most agricultural operations, costs of production are recorded as they are paid. At the time of financial statement preparation, however, these costs all flow directly to the income statement regardless of *the amount of inventory*. These costs are offset by revenues that include both sales as well as the *value of unsold inventory*. Therefore, the flow of costs in an agricultural operation can be illustrated by Figure 5.

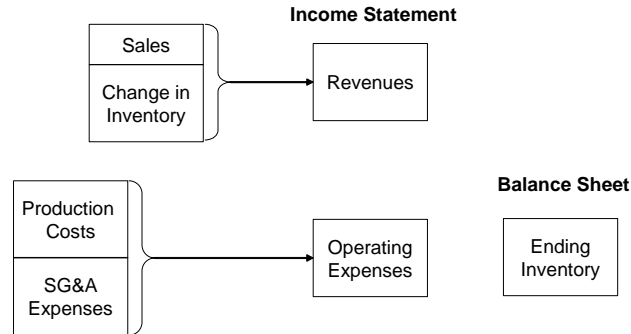


Figure 5. Flow of Costs in an Agricultural Operation

As an illustration, we assume that John and Mary Farmer started their operation in 2004 by renting 2,000 acres of cropland.

For the 2004 crop, they incurred cash production costs during the year of \$440,000 (\$220 per acre) and an additional \$124,000 of depreciation. They also incurred \$35,000 general and administrative costs and \$3,000 marketing expenses during 2004. Finally, they incurred an additional \$50,000 of costs related to the 2005 crop for early seed purchases (\$10,000) and fall application of fertilizer (\$40,000).

At the end of the year, John and Mary had not sold any grain. They had 250,000 bushels of corn in inventory along with 50,000 bushels of soybeans. Their value at on December 31 was \$2.50/bushel and \$5.50 per bushel, respectively.

Using the traditional financial reporting format employed in agriculture (also a recommendation in the **Financial Guidelines for Agricultural Producers**), John and Mary Farmer's income statement for 2004 is shown as Table 1.

Table 1. John and Mary Farmer, Financial Statement, December 2004

John and Mary Farmer Farm Income Statement For the Period January 1, 2004 Thru December 31, 2004			
Revenues			
Crop Revenues [cash]		0	
Increase/ (Decrease) in Crop Accounts Receivable		900,000	
Gross Revenues			900,000
Operating Expenses			
Operating Expenses [cash]	528,000		
(Increase)/Decrease Prepaid Expenses	(10,000)		
(Increase)/Decrease Cash Investment in Growing Crops	(40,000)		
(Increase)/Decrease Other Current Assets	0		
Increase/ (Decrease) Accounts Payable	0		
Increase/ (Decrease) Other Accrued Expenses	0		
Depreciation Expense	124,000		
Amortization of Capital leases	0		
Total Operating Expenses			602,000
Operating Margin			298,000

Several important points need to be noted about this type of reporting.

The value of inventory is based on its market value, not its cost. The total inventory value on the balance sheet as of December 31, 2004 would be \$900,000, the market value of the corn and soybeans. Farmer's balance sheet would also probably show \$40,000 in cash investment in growing crops (fertilizer) and \$10,000 in prepaid expenses (seed) for 2005.

Revenue is earned when the crop is in inventory, not when it is sold. The accrual adjustment in the revenue section provides revenue credit for the entire change in the value of inventory.

No distinction is made in the operating expense section of the income statement between production expenses (cost of goods sold), marketing and transportation expenses, or general and administrative expenses. Rather, the format provides totals for total cash operating expense, the various accrual adjustments to the cash operating expense category, and a depreciation expense amount.

In the context of management accounting, all three of these points would be handled differently.

Inventory is valued at cost within the accounting system. In certain circumstances for external reporting, users may choose to adjust the cost basis value to market value and still be in compliance with GAAP. Maintaining cost values within the accounting system is still preferable.

Revenue is earned when the crop is sold, not when it is available for sale. Again, certain circumstances for external reporting occur when revenue may be recognized when the crop is available for sale (discussed later).

Cost and expense information is clearly delineated between inventory costs (raw materials, work-in-process, and finished goods), cost of goods sold, and other operating expenses.

If a management accounting approach is followed, the 2004 results for John and Mary Farmer would be reported as shown in Table 2.

Table 2. John and Mary Farmer, Statement of Operations, December 2004

John and Mary Farmer	
Statement of Operations	
For the period January 01, 2004 through December 31, 2004	
	Amount
Revenue	
Sales - Corn	-
Sales - Soybeans	-
Total Revenue	-
Production Expense (COGS)	
Production Expense (COGS) - Corn	-
Production Expense (COGS) - Soybeans	-
Total Production Expense (COGS)	-
Production Margin	-
Sales, General and Administrative Expense	
Sales Expense	-
Marketing Expense	3,000
Transportation Expense	-
G&A Expense	35,000
Total Sales, General, and Administrative	38,000
Operating Margin	(38,000)

We can identify the following differences:

No revenues and no production expenses are shown because no sales have occurred. The balance sheet will have a total of \$614,000 in inventories — \$564,000 in finished goods (the corn and soybean inventories at cost), \$40,000 in WIP, representing the fall applied fertilizer, and \$10,000 in raw materials, representing the seed for 2005.

The period expenses (Sales, General and Administrative) are deducted even though there is no revenue. They are deducted because these expenses are not part of the production process (do not “add value” to the inventory) and therefore are expensed as incurred.

At the end of January 2005, Farmer sells all of their grain. However, the corn is sold for \$2.45 per bushel and the soybeans for \$5.60 per bushel. They incur \$0.10 per bushel in transportation costs, an additional \$2,500 during January as general and administrative costs, and \$1,200 related to check-off and marketing expenses for the sale. Using the “traditional” reporting format, Farmer’s income statement for January is shown in Table 3.

Table 3. John and Mary Farmer, Farm Income Statement, January 2005

John and Mary Farmer Farm Income Statement For the Period January 1, 2005 Thru January 31, 2005		
Revenues		
Crop Revenues [cash]	892,500	
Increase/(Decrease) in Crop Inventories	<u>(900,000)</u>	
Gross Revenues		(7,500)
Operating Expenses		
Operating Expenses [cash]	33,700	
(Increase)/Decrease Prepaid Expenses	0	
(Increase)/Decrease Cash Investment in Growing Crops	0	
(Increase)/Decrease Other Current Assets	0	
Increase/(Decrease) Accounts Payable	0	
Increase/(Decrease) Other Accrued Expenses	0	
Depreciation Expense	<u>0</u>	
Total Operating Expenses		33,700
Operating Margin		(41,200)

All cash expenses now flow through the income statement in the period incurred. Cash receipts are shown at the actual amount, and revenue is decreased as inventory goes from \$900,000 at the beginning of the period to zero at the end of January.

The management accounting-based presentation for the month of January is shown in Table 4.

Table 4. John and Mary Farmer, Statement of Operations, January 2005

John and Mary Farmer Statement of Operations For the period January 1, 2005, through January 31, 2005		Amount
Revenue		
Sales - Corn	612,500	
Sales - Soybeans	<u>280,000</u>	
Total Revenue		892,500
Production Expense (COGS)		
Production Expense (COGS) - Corn	338,400	
Production Expense (COGS) - Soybeans	<u>225,600</u>	
Total Production Expense (COGS)		564,000
Production Margin		328,500
Sales, General and Administrative Expense		
Sales Expense	1,200	
Marketing Expense	-	
Transportation Expense	30,000	
G&A Expense	<u>2,500</u>	
Total Sales, General, and Administrative		33,700
Operating Margin		294,800

The sum of operating margins for both approaches for the two periods (all of 2004 plus January 2005) is the same — \$256,800. The difference is in the timing and the detail of the reporting.

The Categories of Inventory — Raw Materials vs. WIP vs. Finished Goods

In understanding the application of traditional inventory accounting to agriculture, it is first important to understand the categories of inventory accounts. Generally, they are divided into three categories:

Raw Materials	This category includes materials that will be used in the production process but have not yet been converted from their raw form. Examples would be seed or chemicals still in their containers, diesel fuel, parts for repairs, etc. These items are always valued at the original cost.
Work-In-Process	This category encompasses goods that are “partially completed” but not yet ready for sale. This is a very significant category of inventories on a farming operation, as it includes all crop and livestock production processes that are not yet completed. WIP includes both direct costs and allocation of indirect costs for a particular cost center. Generally, WIP is accumulated in the various production cost center and support operations cost centers established for the business, and balance sheet reporting may be at a summary or detailed level. WIP is reported at the total cost incurred.
Finished Goods	The finished goods category of inventory includes those products that are “available for sale”. The most common category of finished goods in an ag operation is harvested grain. Livestock tends to be in the “finished goods” state only as it is transferred from WIP to a sale. Again Finished Goods is accumulated and recorded at cost.

Figure 6 shows the flow of costs through the various inventory accounts and to the income statement and balance sheet.

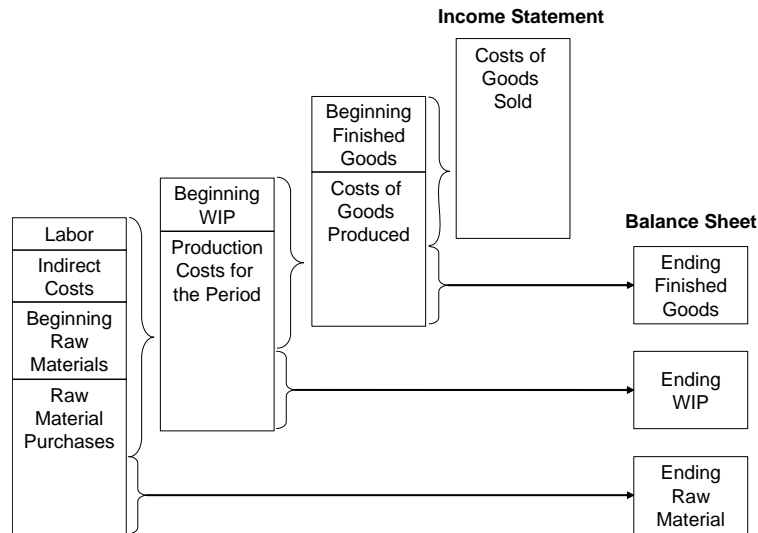


Figure 6. Flow of Costs

Production Cost or Not?

Fundamental to understanding inventory accounting is to be able to make the distinction between whether or not a particular cost item is a production cost or not. The easiest way to think of production costs is that they include:

*All costs associated with the production process
(i.e., costs incurred to bring goods to the point at which they are ready for sale).*

Once we know that a cost is a production cost, it will be capitalized through the raw material to WIP to finished goods process of accumulating inventory costs. It will then be expensed as a cost of goods sold when revenue is recognized.

With production costs defined, we can identify those items that ARE NOT production costs. These costs also can be characterized as period costs. They are not part of the production process but relate to expenses necessary to sell or transport the finished good to market or to expenses relating to general and administrative activities that are not directly related to the production process.

Some common examples of costs and how they would be categorized are presented in Table 5.

Table 5. Categorization of Production or Period Costs

Item	Type Cost	Because
Field labor	Product cost	Necessary to perform field operations and grow the crop
Seed	Product cost	Critical component of the production process
Transportation cost to deliver livestock to market	Period cost (transportation)	Production process complete when the animals are ready to ship; does not enhance the value of the livestock.
Storage cost on grain	Period cost (SG&A)	Cost of storage merely maintaining the quality of the product that is ready for sale; does not enhance the value; therefore expensed in the period incurred
Drying cost for grain	Production cost	Grain drying necessary to finish the production process to get the product ready for sale
Interest	Period cost	Interest expense not directly part of the production process. Some argument that the portion of interest used to finance the production process should be appropriately included as a production cost, few organizations follow that practice because of difficulty in tracking the allocation and accurately identifying interest associated with the production process itself versus interest associated with the financing of capital assets utilized in the business
Depreciation on machinery utilized in field operations	Production cost	Field machinery required for seeding, tillage, harvest, and many other operations involved in the production process; therefore capitalized as a production cost
Depreciation on office computers and furniture	Period cost	The activities for which these assets are utilized are not part of the production process; therefore the depreciation on the assets would be expensed in the period incurred.

More examples of categorization can be found in the chart of accounts discussion section.

The New Importance of Depreciation

Within a management accounting system, depreciation on assets used in the production process takes on a much more important role than has historically been the case in agricultural financial statements. Some farm managers view depreciation as a “memo” charge (not a real expense) to the income of the business, and tax-based depreciation methods are often used.

Lenders and many analysts add depreciation back to net income to calculate repayment capacity, debt coverage, and other financial measures, further reducing any focus or emphasis on the expense. The result of using tax-based depreciation methods is that the entire cost of the asset is written off earlier than the end of the useful life of the asset, and the concept of salvage value is ignored.

The impact of all of these practices is to dramatically overstate depreciation in a farm business and to understate the book value of depreciable assets relative to their market value at any point in time. Therefore, many agricultural financial statements have substantial “valuation equity” on the balance sheet: the market value of depreciable assets is significantly more than their book value. Again, because many lenders and analysts look at market value net worth (which includes this valuation equity) rather than book value, this understatement of asset value is generally ignored.

If management accounting practices are followed, however, tax depreciation will result in a significant overstatement of the cost of inventory as well as the overall cost of production. Even if the gains on disposal of these depreciable assets are included in the appropriate support operations cost center and in the allocation to production cost centers, the uneven timing of disposals will again generate a potentially significant and misleading volatility in production cost.

Therefore, adoption of a management accounting system requires the adoption of a depreciation methodology that attempts to more accurately allocate the cost of the depreciable asset over its useful life and does not depreciate the asset beyond a reasonable salvage value.

Internal versus External Reporting of Inventory

The accumulation of inventory costs within the management accounting system is entirely cost-focused: the identification and allocation of production costs through the various support operations and production cost centers that summarize the transaction flows related to the production process. On a periodic basis, every business must prepare financial reports for external users. The requirements for the reporting of inventory values for external reporting purposes go beyond merely the pure cost-basis methodology that is utilized for internal purposes.

For external reporting, two key criteria must be disclosed and correctly reported in the financial statements.

The Inventory Cost Method. For inventory purposes, cost may be determined by specific identification or by one of three methods that associate a flow of costs with inventory:

1. Average Cost
2. Last-In-First-Out (LIFO)
3. First-In-First-Out (FIFO)

Specific identification or any one of the three methods is acceptable for GAAP. Detailed discussion of these three methods is beyond the scope of this document. We assume that the vast majority of agricultural operations will use specific identification or the average cost approach for their inventory cost method.

Inventory Valuation. GAAP requires an inventory valuation approach generally referred to as the “Lower of Cost or Market” (LCM). In this method, inventory values are reported at their cost, unless in the ordinary course of business, the value of the goods is no longer as great as their cost. No matter what the cause—obsolescence, physical deterioration, changes in price levels—the difference should be recognized by a charge to income in the current period. This charge usually is accomplished by stating the goods at a lower value designated as market.

In the phrase lower of cost or market, “market” means current replacement cost, whether by purchase or by reproduction but is limited to the following maximum and minimum amounts:

- | | |
|----------|---|
| Maximum: | The estimated selling price less any costs of completion and disposal, referred to as net realizable value. |
| Minimum: | Net realizable value less an allowance for normal profit. |

For certain agricultural products (primarily commodity grains), GAAP treatment can also include a market presentation of inventory, even if that value is greater than cost. If this treatment is utilized, it will involve a reduction in cost of goods sold in the period by the amount that market value exceeds cost.

The Concept of Total Unit Cost

The traditional accounting approach accumulates only production costs as the cost of inventory. All other costs are generally considered period costs and are not included in the cost of inventory capitalized on the balance sheet. This approach does not mean, however, that period costs are unimportant at either the whole entity or the product level. Ultimately ALL costs must be covered by the sale of individual products and services. Managers must understand how these non-production costs impact the organization’s overall ability to generate after-tax net income.

All the costs associated with a product, starting with the research and development (R&D) costs incurred in the original development of the product concept through customer service costs must be covered by the sales price of the final product (Figure 7).

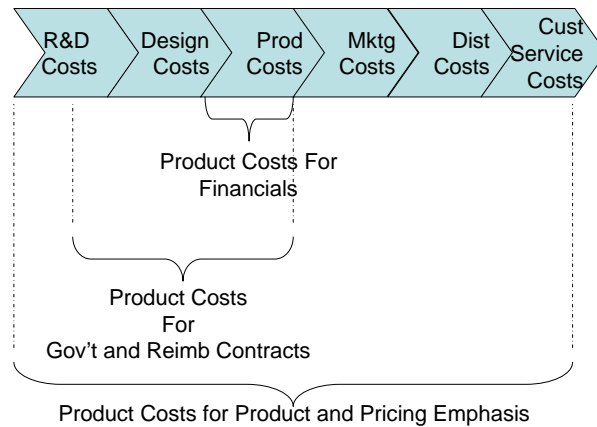


Figure 7. Costs Associated with Product Development, Production, and Final Sales

Only production costs are captured as inventory cost on the financial statements and included in cost of goods sold in the period the products are sold. A slightly broader definition of product costs are included in certain government and reimbursable contracts as part of product costs. Finally, however, understanding that all the costs associated with the design, manufacture, marketing, distribution, and customer service of a particular product must be covered to insure that the sales price of the product over the long run more than covers all of those costs is critical.

Management Accounting Levels of Reporting

In addition to detailed transaction reports and whole entity reports, typical management accounting system reports fall into the following categories:

1. WIP and Inventory Reports show the balances in various WIP accounts/cost centers, raw materials inventory, and finished goods inventory *at a point in time*.
2. Cost Center Reports are of two major types
 - *Activity Reports* showing the total amount of costs accumulated in a particular cost center during a period of time and the total amount of net cost that has been allocated (transferred) to other cost or profit centers during that period; and
 - *Balance Reports* showing the accumulated costs in a particular center at a point in time.
4. Since no difference is shown in amounts between a WIP Report and a Cost Center Activity Report at a particular time, some accounting systems do not provide both.
5. Profit Center Reports show the accumulated revenues, costs, and expenses for a particular profit center for an indicated period of time. Generally, the data in these reports are accumulated in a manner consistent with the overall fiscal year established for the accounting cycle.
6. Commodity Cycle Reports are similar to Profit Center Reports except that they continue to accumulate revenues, costs, and expenses for a particular profit center for a full commodity cycle, even if that cycle goes beyond the fiscal year end. Not all accounting systems can generate Commodity Cycle Reports. If management wants this information, it must be generated outside the core system.

Inventory (Raw Materials, WIP, and Finished Goods) Reporting

Inventory reporting provides details on the current costs accumulated in various inventory accounts. A combined report includes raw materials, WIP, livestock transfer, and finished goods accounts (Figure 8). Not all accounting systems provide this report on a combined basis – the most common distinction is that a WIP inventory report is generated separately from other inventory accounts.

Inventory reporting generally contains quantity information, per unit costs, and total book value data. In addition, most systems allow for the separate entry and reporting of market value amounts for those inventory accounts for the user who wishes to incorporate market value reporting in addition to cost.

The sample report shows two units of quantity for only finished goods (acres and bushels). WIP balances are shown on a per acre basis only, and several of the raw materials accounts do not have quantities at all. Within a managerial accounting system, quantity information is utilized in two ways. The first is for informational purposes, in which case it is optional on the user's part whether to maintain that information in the system. The second purpose of quantity information is for *allocation* entries within the system. In this example, costs accumulated in operations support cost centers are allocated to production cost centers based on acres, and production cost center amounts are allocated to finished goods based on bushels. Therefore, these quantities must be accurately maintained in the system for the information to be correctly classified.

FFSC MA Reporting Example 1 Report of Inventory Balances As of December 31, 2004

Raw Materials Inventory

	Unit 1	Unit 1 Quantity	Cost/Unit 1	Unit 2	Unit 2 Qty	Cost/Unit 2	Book Value	Market Value
Raw Mtl - Crop Chemicals							86,325.00	
Raw Mtls - Seed							73,566.00	
Total Investment in Crop Production							159,891.00	-
Raw Mtls - Feed								
Diesel - Equip	Gallons	890.00	1.76				1,569.00	
Total Investment in Production							1,569.00	-
Total Raw Materials Inventory							161,460.00	-

Work In Process Inventory

	Unit 1	Unit 1 Quantity	Cost/Unit 1	Unit 2	Unit 2 Qty	Cost/Unit 2	Book Value	Market Value
Production Cost Centers - Crop								
Corn	Acres	1350	4.98				6,723.00	
Soybeans	Acres	1270	5.29				6,324.60	
Total WIP - Crop							13,047.60	-
Production Cost Centers - Livestock								
WIP Transfer Accounts - Livestock								
Total WIP - Livestock							-	-
Operations Support Cost Centers								
Machinery							-	
General Crop							-	
Total WIP - Support Cost Centers							-	-
Total WIP Inventory							13,047.60	-

Finished Goods Inventory

	Unit 1	Unit 1 Quantity	Cost/Unit 1	Unit 2	Unit 2 Qty	Cost/Unit 2	Book Value	Market Value
Corn - Raised	Acres	1,420.00	392.08	Bushels	234,300.00	2.38	556,753.60	
Soybeans - Raised	Acres	1,200.00	367.19	Bushels	64,000.00	6.88	440,633.40	
Total Finished Goods Inventory							997,387.00	-

Figure 8. FFSC MA Combined Report of Inventory Balances

Cost Center Reporting

Cost center reporting provides information about the cost pools maintained for operations support and production cost centers. Usually, at a minimum, two types of reports are available at the cost center level: A Cost Center Activity Report and a Cost Center Balance Report.

To effectively understand and utilize cost center reporting, one must understand the allocation methodology incorporated in the accounting system. To illustrate this concept, four cost centers are used: machinery and general crop operations support cost centers, and corn and soybeans production cost centers. The production cost centers (corn and soybeans) utilize an accumulation period of December 1st through November 30th (Figure 9 and Figure 11). Operations support cost center accumulated costs are allocated monthly based on the relative percentage of corn and soybean acres.

The activity reports for corn and soybeans shows the entire production period (December 1 through November 30) and the balance reports show balances as of December 31 (Figure 10 and Figure 12). Operations support reports are run for the same periods and date so that they support the numbers included in the production cost center reports.

FFSC MA Reporting Example 1 Corn Production Cost Center Activity Report For the period December 01, 2003 through November 30, 2004				
	Amount	Qty 1	Qty 2	
		Acres	Bushels	
Revenue		1,420	234,300	
Multi-Peril Insurance	4,544	3.20	0.02	
Total Revenue	4,544	3.20	0.02	
Direct Production Cost				
Land Rent Cost	184,600	130.00	0.79	
Chemicals	24,424	17.20	0.10	
Seed	52,540	37.00	0.22	
Fertilizer	149,100	105.00	0.64	
Fertilizer Application	7,569	5.33	0.03	
Insur - Crop	15,904	11.20	0.07	
Agronomist/Scout	5,680	4.00	0.02	
Repairs - Improv & Bldgs	114	0.08	0.00	
Grain Drying Cost	5,254	3.70	0.02	
Other Misc	1,420	1.00	0.01	
Total Direct Production Cost	446,604	314.51	1.91	
Indirect Production Cost				
Machinery	65,916	46.42	0.28	
General Crop	48,777	34.35	0.21	
Total Indirect Production Cost	114,693	80.77	0.49	
Total Production Cost	561,298	395.28	2.40	
Total Production Cost Net of Revenue	556,754	392.08	2.38	
Allocated to	Amount	%		
Finished Goods - Corn	556,754	100%		
Total	556,754	100%		

Figure 9. FFSC MA Reporting Example 1
Corn Production on Cost Center Activity Report

FFSC MA Reporting Example 1 Corn Production Cost Center Balance Report As of December 31, 2004				
	Amount	Qty 1	Qty 2	
		Acres	Bushels	
Revenue	-	-	-	
Multi-Peril Insurance	-	-	-	
Total Revenue	-	-	-	
Direct Production Cost				
Land Rent Cost	-	-	-	
Chemicals	-	-	-	
Seed	-	-	-	
Fertilizer	-	-	-	
Fertilizer Application	-	-	-	
Insur - Crop	-	-	-	
Agronomist/Scout	-	-	-	
Repairs - Improv & Bldgs	-	-	-	
Grain Drying Cost	-	-	-	
Other Misc	-	-	-	
Total Direct Production Cost	-	-	-	
Indirect Production Cost				
Machinery	3,497	2.59	-	
General Crop	3,227	2.39	-	
Total Indirect Production Cost	6,723	4.98	-	
Total Production Cost	6,723	4.98	-	
Total Production Cost Net of Revenue	6,723	4.98	-	
Allocated to	Amount	%		
		0%		
Total	-	0%		

Figure 10. FFSC MA Reporting Example 1
Corn Production on Cost Center Balance Report

FFSC MA Reporting Example 1 Soybeans Production Cost Center Activity Report For the period December 01, 2003 through November 30, 2004				
	Amount	Per Qty 1	Per Qty 2	
		Acres	Bushels	
Revenue		1,200	54,000	
Total Revenue	-	-	-	
Direct Production Cost				
Land Rent Cost	156,000	130.00	2.89	
Chemicals	22,800	19.00	0.42	
Seed	22,800	19.00	0.42	
Technology Fees	4,200	3.50	0.08	
Fertilizer	50,400	42.00	0.93	
Fertilizer Application	2,400	2.00	0.04	
Insur - Crop	10,800	9.00	0.20	
Agronomist/Scout	4,800	4.00	0.09	
Other Misc	2,040	1.70	0.04	
Total Direct Production Cost	276,240	230.20	5.12	
Indirect Production Cost				
Machinery	55,704	54.93	1.22	
General Crop	48,777	40.65	0.90	
Total Indirect Production Cost	104,481	95.58	2.12	
Total Production Cost	380,721	325.78	7.24	
Total Production Cost Net of Revenue	380,721	325.78	7.24	
Allocated to	Amount	%		
Finished Goods - Soybeans	380,721	100%		
Total	380,721	100%		

Figure 11. FFSC MA Reporting Example 1
Soybean Production on Cost Center Activity Report

FFSC MA Reporting Example 1 Soybeans Production Cost Center Balance Report As of December 31, 2004				
	Amount	Per Qty 1	Per Qty 2	
		Acres	Bushels	
Revenue	-	-	-	
Total Revenue	-	-	-	
Direct Production Cost				
Land Rent Cost	-	-	-	
Chemicals	-	-	-	
Seed	-	-	-	
Technology Fees	-	-	-	
Fertilizer	-	-	-	
Fertilizer Application	-	-	-	
Insur - Crop	-	-	-	
Agronomist/Scout	-	-	-	
Other Misc	-	-	-	
Total Direct Production Cost	-	-	-	
Indirect Production Cost				
Machinery	3,289	2.75	-	
General Crop	3,035	2.54	-	
Total Indirect Production Cost	6,325	5.29	-	
Total Production Cost	6,325	5.29	-	
Total Production Cost Net of Revenue	6,325	5.29	-	
Allocated to	Amount	%		
		0%		
Total	-	0%		

Figure 12. FFSC MA Reporting Example 1
Soybean Production on Cost Center Balance Report

FFSC MA Reporting Example 1			
Machinery Operations Support Cost Center Activity Report			
For the period December 01, 2003 through November 30, 2004			
		Per Qty 1	Per Qty 2
		Acres	-
Revenue	Amount	2,620	-
Total Revenue	-	-	-
Direct Production Cost			
Gasoline	8,384	3.20	
Off road	23,580	9.00	
Oil & Lubes	6,026	2.30	
Insur - M & E	4,323	1.65	
Rental Equipment	1,179	0.45	
Repairs -M & E	12,838	4.90	
Supplies and Parts	5,240	2.00	
Electricity	2,410	0.92	
Depr - M & E	57,640	22.00	
Total Direct Production Cost	121,620	46.42	-
Indirect Production Cost			
Total Indirect Production Cost	-	-	-
Total Production Cost	121,620	46.42	-
Total Production Cost Net of Revenue	121,620	46.42	-
Allocated to		Amount	%
Machinery Costs - Corn Production Cost Center		65,916	54%
Machinery Costs - Soybean Production Cost Center		55,704	46%
Total		121,620	100%

Figure 13. FFSC MA Reporting Example 1
Machinery Operations Support Cost Center Activity Report

FFSC MA Reporting Example 1			
Machinery Operations Support Cost Center Balance Report			
As of December 31, 2004			
		Per Qty 1	Per Qty 2
	Amount	Acres	
Revenue		2,620	-
Total Revenue	-	-	-
Direct Production Cost			
Gasoline	-	-	
Off road	-	-	
Oil & Lubes	-	-	
Insur - M & E	314	0.12	
Rental Equipment	-	-	
Repairs -M & E	1,310	0.50	
Supplies and Parts	262	0.10	
Electricity	183	0.07	
Depr - M & E	4,716	1.80	
Total Direct Production Cost	6,786	2.59	-
Indirect Production Cost			
Total Indirect Production Cost	-	-	-
Total Production Cost	6,786	2.59	-
Total Production Cost Net of Revenue	6,786	2.59	-
</			

Figure 14. FFSC MA Reporting Example 1
Machinery Operations Support Cost Center Balance Report

FFSC MA Reporting Example 1															
General Crop Operations Support Cost Center Activity Report															
For the period December 01, 2003 through November 30, 2004															
		Per Qty 1	Per Qty 2												
	Amount	Acres	-												
Revenue		2,620	-												
Total Revenue	-	-	-												
Direct Production Cost															
Wages	47,684	18.20													
Contract Labor	9,432	3.60													
Gasoline	6,026	2.30													
Depr - Improv & Bldgs	4,323	1.65													
Depr - Vehicle	8,384	3.20													
Insur - Improv & Bldgs	2,096	0.80													
Insur - Vehicle	2,882	1.10													
Repairs - Improv & Bldgs	786	0.30													
Repairs - Vehicle	3,406	1.30													
Utilities	4,978	1.90													
Total Direct Production Cost	89,997	34.35	-												
Indirect Production Cost															
Total Indirect Production Cost	-	-	-												
Total Production Cost	89,997	34.35	-												
Total Production Cost Net of Revenue	89,997	34.35	-												
<table> <tr> <th>Allocated to</th> <th>Amount</th> <th>%</th> </tr> <tr> <td>General Crop Costs - Corn Production Cost Center</td> <td>48,777</td> <td>54%</td> </tr> <tr> <td>General Crop Costs - Soybean Production Cost Center</td> <td>41,220</td> <td>46%</td> </tr> <tr> <td>Total</td> <td>89,997</td> <td>100%</td> </tr> </table>				Allocated to	Amount	%	General Crop Costs - Corn Production Cost Center	48,777	54%	General Crop Costs - Soybean Production Cost Center	41,220	46%	Total	89,997	100%
Allocated to	Amount	%													
General Crop Costs - Corn Production Cost Center	48,777	54%													
General Crop Costs - Soybean Production Cost Center	41,220	46%													
Total	89,997	100%													

Figure 15. FFSC MA Reporting Example 1
General Crop Operations Support Cost Center Activity Report

FFSC MA Reporting Example 1
General Crop Operations Support Cost Center Balance Report
As of December 31, 2004

	Amount	Per Qty 1	Per Qty 2												
		Acres													
Revenue		2,620													
Total Revenue	-	-	-												
Direct Production Cost															
Wages	4,192	1.60													
Contract Labor	-	-													
Gasoline	524	0.20													
Depr - Improv & Bldgs	314	0.12													
Depr - Vehicle	681	0.26													
Insur - Improv & Bldgs	183	0.07													
Insur - Vehicle	236	0.09													
Repairs - Improv & Bldgs	-	-													
Repairs - Vehicle	-	-													
Utilities	131	0.05													
Total Direct Production Cost	6,262	2.39	-												
Indirect Production Cost															
Total Indirect Production Cost	-	-	-												
Total Production Cost	6,262	2.39	-												
Total Production Cost Net of Revenue	6,262	2.39	-												
<table> <tr> <th>Allocated to</th> <th>Amount</th> <th>%</th> </tr> <tr> <td>General Crop Costs - Corn Production Cost Center</td> <td>3,227</td> <td>52%</td> </tr> <tr> <td>General Crop Costs - Soybean Production Cost Center</td> <td>3,035</td> <td>48%</td> </tr> <tr> <td>Total</td> <td>6,262</td> <td>100%</td> </tr> </table>				Allocated to	Amount	%	General Crop Costs - Corn Production Cost Center	3,227	52%	General Crop Costs - Soybean Production Cost Center	3,035	48%	Total	6,262	100%
Allocated to	Amount	%													
General Crop Costs - Corn Production Cost Center	3,227	52%													
General Crop Costs - Soybean Production Cost Center	3,035	48%													
Total	6,262	100%													

Figure 16. FFSC MA Reporting Example 1
General Crop Operations Support Cost Center Balance Report

Sales, Marketing, and Transportation; and Other Expense Cost Center Reporting

FFSC MA Reporting Example 1				
Sales, Marketing, and Transportation Cost Center Activity Report				
For the period January 01, 2004 through December 31, 2004				
	Amount	Per Qty 1 Acres	Per Qty 2 -	
Sales Expense				
Checkoff Exp	979	0.37		
Storage Expense	10,643	4.06		
Total Sales Expense	11,622	4.44	-	
Marketing Expense				
Advertising Expense	800	0.31		
Total Marketing Expense	800	0.31	-	
Transportation Expense				
Transportation Expense	17,453	6.66		
Total Transportation Expense	17,453	6.66	-	
Total Sales, Marketing, and Transportation Expense	29,875	11.40	-	
Allocated to	Amount	%		
Sales Expense - Crop Profit Center	11,622	39%		
Marketing Expense - Crop Profit Center	800	3%		
Transportation Expense - Crop Profit Center	17,453	58%		
Total	29,875	100%		

Figure 17. FFSC MA Reporting Example 1
Sales, Marketing, and Transportation
Cost Center Activity Report

FFSC MA Reporting Example 1				
Other Expense Cost Center Activity Report				
For the period January 01, 2004 through December 31, 2004				
	Amount	Per Qty 1 Acres	Per Qty 2 -	
Interest Expense (Net)				
Int Exp - Operating Loan	12,678	4.84		
Int Exp - Notes Payable	28,643	10.93		
Interest Income	(1,465)	(0.56)		
Total Interest Expense (Net)	39,856	15.21	-	
(Gain) Loss on Non-Operating Asset Disposition				
Gain (Loss) on Investment Assets	(2,765)	(1.06)		
Total (Gain) Loss on Non-Operating Asset Disposition	(2,765)	(1.06)	-	
Misc Expense				
Total Misc Expense	-	-	-	
Total Other Expense	37,091	14.16	-	
Allocated to	Amount	%		
Finance Income (Expense) - Crop Profit Center	39,856	107%		
G/(L) on Non-Operating Assets - Crop Profit Center	(2,765)	-7%		
Misc Income (Expense)	-	0%		
Total	37,091	100%		

Figure 18. FFSC MA Reporting Example 1
Other Expense Cost Center Balance Report

Profit Center Reporting

FFSC MA Reporting Example 1 Crop Profit Center Report For the period January 01, 2004 through December 31, 2004			
		Qty 1	Qty 2
		Acres	
	Amount	2,620	-
Revenue			
Sales - Corn	638,000	243.51	
Sales - Soybeans	230,400	87.94	
Total Revenue	868,400	331.45	-
Production Expense (COGS)			
Production Expense (COGS) - Corn	572,000	218.32	
Production Expense (COGS) - Soybeans	159,040	60.70	
Total Production Expense (COGS)	731,040	279.02	-
Production Margin	137,360	52.43	-
Other Operating Expenses			
Sales, Marketing, and Transportation Expense			
Sales Expense	11,622	4.44	-
Marketing Expense	800	0.31	-
Transportation Expense	17,453	6.66	-
Total Sales, Marketing, and Transportation	29,875	11.40	-
G&A Expense			
G&A Expense	37,377	14.27	-
Total G&A Expense	37,377	14.27	-
Total S, G&A	67,252	25.67	-
Operating Margin	70,108	26.76	-
Other Expense			
Interest Expense (Net)	39,856	15.21	-
(Gain) Loss on Non-Operating Asset Disposal	(2,765)	(1.06)	-
Other Non-Operating Items	-	-	-
Total Other Expense	37,091	14.16	-
Total Expense	835,383	318.85	-
Net Income Before Tax	33,017	12.60	-

Figure 19. FFSC MA Reporting Example 1, Crop Profit Center Report

Balance Sheet Reporting

FFSC MA Reporting Example 1	
Balance Sheet	
As of December 31, 2004	
Current Assets	
Cash	14,653
Account Receivables	7,541
Prepaid Expense	16,975
Hedging Account	3,316
Inventory	
Raw Materials	161,460
WIP - Corn	-
WIP - Soybeans	-
WIP - Machinery	6,786
WIP - General Crop	6,262
Finished Goods - Corn	556,754
Finished Goods - Soybeans	440,633
Total Inventories	<u>1,171,895</u>
Security Deposits	850
Other Current Assets	4,652
Total Current Assets	<u>1,219,882</u>
Non-Current Assets	
Vehicles (Net)	14,886
M&E (Net)	466,197
B&I (Net)	28,953
Capital Asset Revaluation - Non-Real Estate	18,642
Real Estate at Cost	85,640
Capital Asset Revaluation - Real Estate	120,000
Total Non-Current Assets	<u>734,318</u>
Total Assets	<u>1,954,200</u>
Current Liabilities	
Account Payables	6,495
Accrued Interest	1,570
Operating Loan	87,000
Income Tax Payable	8,600
Deferred Tax Liability - Current	418,000
Current Portion Notes Payable	27,963
Current Portion Mortgage Payable	-
Other Accrued Liabilities	845
Total Current Liabilities	<u>550,473</u>
Non-Current Liabilities	
Notes Payable	186,423
Less Current Portion Notes Payable	(27,963)
Mortgage Payable	-
Less Current Portion Mortgage Payable	-
Deferred Tax Liability - Valuation Related	20,796
Total Non-Current Liabilities	<u>158,460</u>
Total Liabilities	<u>708,933</u>
Owner Equity	
Contributed Capital	85,000
Retained Earnings	1,000,598
Current Year Income (Loss)	41,823
Valuation Equity - Gross	138,642
Valuation Equity - Deferred Tax Offset	(20,796)
Total Owner Equity	<u>1,245,267</u>
Total Liabilities and Owner Equity	<u>1,954,200</u>

Figure 20. FFSC MA Reporting Example 1, Balance Sheet

Managerial Accounting Issues for Agriculture

Depreciation

Background/Overview

Depreciation is commonly used to describe a decline in the value of an item. However, in an accounting context, depreciation is not an issue of valuation. Rather it is commonly defined as the systematic and rational process of allocating the costs of capital assets to operations over the periods expected to benefit from the use of these assets.

The business acquires resources (assets) from which it expects to receive future benefit. These resources encompass all those items commonly referred to as production inputs such as feed, seed, chemicals, repairs and supplies to the tools used to facilitate the production such as tractors, planters, trucks, feed wagons, and cattle feedlot improvements. If these assets provide benefits over periods beyond the year of acquisition or current production cycle, they are commonly referred to as capital assets and the resources expended to acquire them are capital costs.

For example, a farm incurs a capital cost of \$160,000 to acquire a combine (a capital asset). This combine harvests 4,000 acres of production in the year it is acquired. If this capital cost were fully charged to operations during the year of acquisition, it would result in a charge of some \$40 ($\$160,000 / 4,000$ acres) per acre during this year of acquisition even though the farmer may very well harvest many more thousands of acres of production in future years while he owns the combine. Charging the full cost to the first year would result in an overstatement of production costs in the first year and an understatement of costs in subsequent years.

The proper matching of the value created (revenue from selling the production) and the resources consumed in creating the value (expenses of the items sold) require these capital costs to be charged against the production costs of future periods expected to benefit from and consume the capital assets. This matching concept is a core component of GAAP. The depreciation process is an effort to accomplish this necessary matching.

Although tax depreciation methods have typically been aggressive in the rate at which capital costs are charged to operations, when the FFSC originally wrote the *Financial Guidelines for Agricultural Producers*, the FFSC felt that using tax methods derived amounts was acceptable. Considerations included the availability of alternatively sourced amounts and the likely extent and nature of distortion. At that time the FFSC said, "... [We do] not believe that a tax-based depreciation charge would be materially misleading for most farm operations."

In recent years, tax depreciation has been increasingly aggressive. Currently, it is possible to charge off approximately \$285,000 of a total of \$400,000 in annual capital costs. At this rate of tax depreciation, clearly severe distortion of the annual depreciation charge is likely with current tax laws. The tax depreciation approach no longer fits the definitional parameters of depreciation as being a process of systematically and rationally allocating the costs of capital assets to operations over the periods that benefit from the use of the assets.

In recognition of this change, the FFSC has updated its position on depreciation expressed in the *Financial Guidelines for Agricultural Producers* and now states, "...the FFSC encourages producers to adopt book depreciation methods with appropriate useful lives and salvage values for the most accurate allocation of the purchase price of a depreciable asset over its useful life."

While the FFSC encourages producers to adopt book or management depreciation for whole entity financial reporting and analysis purposes, book/management depreciation methods must be adopted when employing a managerial accounting system. This requirement has significant implication to the producer's implementation of the managerial accounting system both from the impact on cost management/cost of production determination and the financial reporting and analysis at the entity level. Among the considerations are understanding the:

- Depreciation process,
- Deferred tax impact,
- Disclosure requirements,

- Financial and credit analysis implications, and
- Handling of gains and losses on capital asset trades.

Depreciation Process

Three essential information elements are required to determine the periodic depreciation amount that is charged to operations:

1. What is the asset's useful life?
2. What is the depreciable cost?
3. What method of cost allocation to use?

The useful life of an asset is an estimate of the length of service the producer expects from the asset in the context of his operation and the way he typically uses such assets in the business. Assets are generally removed from service for either physical or functional reasons. The most common physical factor for removing an asset from service is that it is worn out. Functional factors would commonly be that an asset has become technically obsolete or has otherwise become inadequate to meet the needs of the business.

Useful life needs to be specified in accordance with the parameters of each operation. Producers can employ identical assets in very different ways. Some producers will trade a planter after 4 or 5 years, and others will use that same type planter in similar situations for 10 years or more. The useful life specification for a particular asset does not necessarily represent its physical life.

The useful life of the asset must be measured in a manner consistent with the cost allocation method used. The unit of measure needs to be common to both. Depreciating a planter with a 40,000-acre useful life estimate (an activity measure) on a straight line depreciation method (a chronological measure) is not possible.

The depreciable cost for an asset is the capital cost reduced by the estimated value of the capital asset at the end of its *planned* useful life. This estimated value of the capital asset at the end of its useful life is often referred to as its salvage value. The formula is:

$$\text{Depreciable Base} = \text{Capital Cost} - \text{Salvage Value}$$

Capital costs typically include all costs associated with getting the asset into serviceable condition where it will be used. Consequently, this preparation will likely include such items as transportation and setup/modification in addition to the purchase cost of the asset.

The primary consideration in selecting a cost allocation method is that it must be systematic and rational. Several methods meet these requirements, although a few methods are most commonly employed throughout the commercial world. The most common depreciation methods are:

1. Straight line method,
2. Declining balance or other accelerated methods, and
3. Activity method.

These depreciation methods imply different assumptions about how operations consume the capital cost of employed assets. Other depreciation methods are available but infrequently used even in specialized situations. Because they are not commonly employed, they are not addressed in this material.

The straight line method is perhaps the simplest approach. It presumes that the capital cost is used equally apportioned over time. This chronological method involves the useful life typically being specified in months or years. The useful life is divided into the depreciable cost to derive the depreciation for the time period.

The declining balance approach results in more depreciation being charged to operations in the early part of the life of an asset with a lesser amount being charged in the later years of useful life. This approach is also often referred to as an accelerated approach to depreciation. The underlying rationale for using an accelerated method is that the benefits received from using an asset decline as the asset ages. Maintenance costs increase as an asset ages so that over the life of an asset depreciated in this manner, the total charge to operations for both depreciation and maintenance is more consistent.

Two common accelerated methods are available: sum-of-the-years-digit and declining-balance. Additionally, a couple of commonly used variations of the declining-balance method are available. These are typically 150%-declining-balance and double-declining-balance (200% of the straight line amount).

In the sum-of-the-years-digits approach, the annual depreciation charge is the depreciable cost multiplied by a fraction. The numerator of this fraction is the number of years of useful life remaining and the denominator is the sum of the years of useful life. For example the fraction used with a five year useful life in the first year is 5/15 times the depreciable cost. In the first year 5 years useful live remain. The sum of years of useful life is 15 ($5 + 4 + 3 + 2 + 1 = 15$).

The declining-balance method involves multiplying the declining-balance factor (typically 150% or 200%) times the capital cost reduced for any prior year's depreciation charge. In the first year, the depreciation charge is the full capital cost times the declining-balance factor. In year two, the depreciation charge is the net of the capital cost less the prior year's depreciation charge (often referred to as net book value) multiplied by the declining-balance factor. The factor (percentage) stays the same each year while the net book value to which it is applied declines. This process is continued each period until the net book value reaches the salvage value. At that point the depreciation process is completed for this particular asset.

The activity method assumes that the capital cost is consumed in operations as the asset is used as opposed to being used up over time. This method is a measure of activity rather than the more common time based measure. The activity is typically a measure of input (e.g., hours of use or acres covered) or output (units produced). Since the output is generally a primary focus of the business, it makes sense to use an output measure of activity when it is practically available. The periodic charge is the activity measure for the period divided by the total activity estimate for the life of the asset times the depreciable cost of the asset.

A potential complicating issue in applying the depreciation process occurs when one of the essential elements of the depreciation calculation changes. Changes may occur for several reasons including unexpected physical deterioration, unforeseen obsolescence, improved maintenance and technology, changes in operating procedures, or changes in asset management plans.

One likely situation is a material change in the estimated useful life. Perhaps a producer discovers the asset is working out so well that, rather than hold and use the item for an originally planned 6 years, it will be retained and continues in service for an estimated additional 4 years – or a revised total service life of 10 years. This change in estimates occurs in year four of ownership. The proper handling of these changes in estimates is to apply the depreciation process to the asset position at the time of the change in estimates.

Thus, the salvage value estimate is updated along with the change in estimated useful life. These revised depreciation elements should then be applied to the net book value of the asset at the time of the estimate change. The remaining un-depreciated cost (as recalculated) is then depreciated over the remaining useful life in accordance with the depreciation method appropriate at that time. No change is made to previously reported results.

Deferred Taxes Related Changes

This section of the managerial accounting guidelines is intended to point out how the calculation of deferred taxes is influenced by the adoption of book depreciation in the accounting process. *Financial Guidelines for Agricultural Producers* extensively addresses the issue of deferred taxes.

One component of the deferred tax calculation is the income tax difference resulting from a difference in book earnings and taxable earnings. Agriculture has traditionally followed the practice of using tax depreciation for determining book earnings particularly for non-current depreciable capital assets such as purchased breeding livestock, machinery and equipment, and buildings and improvements. Consequently, no deferred tax influence comes from these items since the annual depreciation charge was the same for book and tax purposes; these items essentially carried the same basis for both tax and book purposes. However, the adoption of a management depreciation approach typically creates a material difference between the book and tax earnings and the book and tax basis. This additional difference between the book and tax basis of these non-current assets results in an additional non-current deferred tax component.

Disclosure Requirements

The adoption of a management approach to depreciation increases the need to more fully disclose to external users information about the depreciation process choices made and their financial implications. Increased external disclosure is necessary even though implementing a managerial accounting system is largely to improve the availability of high quality, integrated financial and production information for internal uses.

Normal disclosures include:

- Depreciation expense for the period,
- Balance of major classes of depreciable assets at the balance sheet date,
- Accumulated depreciation, and
- General description of the methods used in computing depreciation for major classes of depreciable assets.

Financial and Credit Analysis Implications

Nearly all financial ratios recommended by the FFSC are either influenced by the annual depreciation expense or specifically include depreciation as a component of their calculation. Among those that specifically include depreciation in their calculation are Term Debt and Capital Lease Coverage Ratio, Capital Replacement and Term Debt Repayment Margin Ratio, and the Depreciation/Amortization Expense Ratio.

The disclosure requirements mentioned above are generally straight forward with the exception of the actual depreciation expense for the period. By definition, depreciation expense is intended to be the amount of depreciation that is contained in the income statement for the year. The use of the annual tax depreciation amount as the depreciation expense for farm financial statement purposes made this amount easy to obtain.

However, depreciation related to production activities is contained in various work in process and finished goods inventory accounts and is ultimately expensed to the income statement through the cost of goods sold accounts. Once it is initially charged to production in the various cost centers and allocated to other cost centers as an indirect cost, it is no longer specifically identifiable. Determining precisely the amount of depreciation expensed in the income statement during the year becomes impractical.

Consequently, accountants generally report/disclose both the amount of depreciation charged to production costs and to expense accounts during the year as the total depreciation expense for the year. This practice is the normal approach even though depreciation included in beginning and ending inventories may vary sufficiently to affect depreciation actually included in cost of goods sold for the year.

Another implication of the adoption of management depreciation on financial and credit analysis is the way agriculture has traditionally looked at depreciation when making a financial or credit assessment. We have often taken some comfort in the presence of otherwise marginal financial measures because, with the frequent overstatement of depreciation expense, we were confident we were building a hidden valuation equity condition. With a move to the use of management depreciation, earnings will be more realistic and the depreciable assets presented on the balance sheet are more likely to reflect a more accurate picture of the remaining, unconsumed portion of the capital assets and not reflect some materially understated position. In this depreciation environment, debt repayment capacity will be much closer to reported net income than traditionally expected.

Handling of Gains and Losses on Capital Asset Trades

Finally, a move away from a tax dependent depreciation methodology to a management depreciation approach raises the issue of how to handle gains and losses on trades of capital assets. The common approach in agriculture has been to follow the tax practice of deferring the gain on the disposed asset into a reduction in the basis of the acquired asset. This procedure has allowed producers to avoid paying income taxes on these gains, which are often significant in light of aggressive depreciation practices. Having used the tax depreciation as a proxy for operating depreciation we have typically followed the same practice for operational reporting.

It is important to understand that in a management depreciation construct a gain or loss on disposition of an asset – whether via trade, abandonment, or outright sale – is indicative of the extent of error in our estimates when we set up the depreciation for the asset. A gain on disposition results when the proceeds received are greater than the net book value of the asset at the time of disposal. A loss on disposition results when the proceeds received are less than the net book value of the asset at the time of disposal.

A gain is indicative of excess depreciation (and an overstatement of costs/expense) during the term of use of the concerned asset. Conversely, a loss on disposition is indicative of too little depreciation (and an understatement of costs/expenses) during the term of use of the concerned asset.

Two fundamental approaches are used to handle gains and losses relating to the trade of one asset for another:

1. Separate the gain or loss on the disposed asset from the depreciation set up of the acquired asset. The two transactions are essentially separate other than using a realistic trade-in value as the amount received for the disposed asset. The disposition of the traded asset is essentially treated as a sale. The separate transaction approach allows for the correction of prior errors in estimates and does not continue the distortion that resulted from those misestimates.

When applying the separate transaction approach to handling gains and losses on trade dispositions, the trade-in value shown on a sale invoice is not necessarily an accurate reflection of the amount received for the asset traded-in. Many sales invoices commonly materially overstate the trade-in value of traded-in assets. These overstated trade-in values are applied to manufacturer's suggested retail prices that are commonly discounted to derive the actual incremental amount required to complete the transaction.

Using a realistic value for the disposition proceeds is important to accurately reflect the gain/loss on disposition. Furthermore, using a realistic trade-in value also results in a more accurate capital cost for the acquired asset by reflecting the discounts commonly available. Failure to use realistic values for the trade-in proceeds and capital cost will result in an overstatement of gain or understatement of loss on disposition and will set up the operation to overstate future depreciation costs/expense as a result of an overstated capital cost.

2. The second approach to handling the gains and losses on the trade of one asset for another is to continue the tax practice of deferring the gain/loss into an adjustment in the capital cost of the acquired asset. This sequenced transaction approach avoids the need to accurately reflect the value received for a trade-in while continuing any fundamental errors in estimates into the capital cost of the acquired asset. However, there is an opportunity to adjust the estimates of useful life and salvage value on the newly acquired asset.

Both the separate and sequenced transaction approaches are commonly used, and logical arguments exist for the benefits of either approach. From a purely managerial accounting view, the separate transaction approach probably provides more accurate assessment of ongoing cost. The sequenced approach avoids the necessity of calculating the true value of the trade-ins and is more consistent with the way trade-ins are handled for tax purposes.

One final aspect of the implications of gains and losses from the disposition of assets is of how these gains/losses are included in the managerial accounting process. Two common theoretical approaches exist to handling these gains/losses. One approach is to place all gains/losses in the Other Expense (Finance) cost center as non-production items. The other approach is to charge the gains/losses to the cost center where the depreciation of the asset was charged. The FFSC recommends this latter approach. Applying gains/losses to the cost centers where the assets were depreciated brings the correction to that segment of the operation that has been previously misstated. Additionally, this approach provides for the continued segregation of production and non-production activities.

Summary

The use of a management depreciation approach is an essential part of an effective implementation of a managerial accounting system. It facilitates a more accurate apportionment of capital costs to the cost centers of the operation and to operating periods that benefit from and consume the organization's capital assets. A management depreciation approach is likely to require significantly more administrative effort, more record keeping capabilities and supporting systems than is common in agricultural production operations. The principal payoff for adopting this approach will be significantly more accurate depreciation cost/expense along with a more complete allocation of these costs to the portions of the business where the capital assets are employed.

Standard Costing

Standard costs are a key component of many managerial accounting systems. They are most often utilized in manufacturing operations, but can also be applied in non-manufacturing businesses. This topic area is extremely broad, and entire textbooks are devoted to the topic. The purpose of the discussion included here is to provide the reader with a brief background of what standard costs are, how they are commonly utilized in a managerial accounting system, and some of the issues involved in applying a standard costing methodology to agriculture.

At the simplest level, standard costing is really a technique to incorporate the budgeting process deep into the accounting system, to better understand cost behavior and the effectiveness of the budgeting system itself. It may also be the key to producing more timely managerial accounting information.

Standard Costs Defined

Standard cost is traditionally defined as *predetermined costs required to make a product or produce a service*. For example, a manufacturer of widgets might develop the following standard costs for the production of their Widget Lite product:

Table 6. Bill of Materials

Resource	Quantity	Unit	Cost per Unit	Total
Steel	0.50	Lb	\$11.00	\$5.50
Gaskets	2.00	Ea	\$0.89	\$1.78
Bolts	9.00	Ea	\$1.20	\$10.80
Paint	2.00	Oz	\$0.50	\$1.00
Direct Labor	1.50	Hour	\$12.00	\$18.00
Overhead (Indirect Costs)	1.50	Direct Labor Hour	\$6.00	\$9.00
			Total	\$46.08

This schedule is also often referred to as a *Bill of Materials (BOM)* for the product being manufactured. It is essentially a recipe for producing the product complete with the estimated cost of the ingredients.

Standard costs include both the quantity of the resource required and the cost per unit of each resource required. Those details are important to be able to do the performance analysis that is an integral part of standard costing.

Note that this BOM has a single line for Overhead (or Indirect Costs), and that the overhead is allocated based on the number of Direct Labor Hours. There are a number of options that can be used in allocating Overhead to products or services, and they are discussed in the following section for agricultural operations. In the last 20-30 years, however, there has been increasing adoption of more sophisticated ways to assign costs and allocate these indirect costs in a standard costing system. Rather than use a quantity of resource actually used in production (such as direct labor hours or machine hours, the actual indirect activities are allocated based on their individual costs). This is referred to as Activity Based Costing (ABC).

With ABC, instead of allocating Overhead/Indirect Costs based on Direct Labor Hours, the actual activities that create the indirect costs are identified and a "standard" cost assigned to each of them. They are then allocated into the BOM based on the quantity of each of those activities required to produce the product. ABC is particularly useful in service businesses, and as we shall see below, the concept is very useful in agricultural operations.

The Benefits and Application of Standard Costing in Managerial Accounting

Why Use Standards?

There are several key reasons why organizations will adopt standard costing methodologies:

1. Cost control
2. Pricing/marketing decisions
3. Uniform performance measurement
4. Cost awareness

Predetermined overhead rates are usually used rather than actual overhead rates, for three reasons

- Predetermined overhead rates permit indirect cost to be applied to cost objects at the same time direct costs are applied, rather than waiting for the end of the accounting period;
 - Predetermined overhead rates provide anticipated product or service cost information that can be used in pricing and product line decisions; and
 - Predetermined overhead rates reduce the amount of effort required to maintain a system because the overhead rates do not have to be recalculated each period."
- Harvard Business School, "Accounting for Indirect Costs", William J. Burns, Jr.

Setting Standards

The process of setting standards is driven by the types of products, services, or activities for which you will utilize standard costs, and the level of detail at which you determine that standards are important in each of those categories.

You can develop standard costs for all products/services, for a subset of them, or just for certain activities that are part of the production process and for which costs need to be allocated. We will discuss those areas in typical agricultural operations most conducive to the standard costing process in the section following.

Variance Analysis

A *variance* is the difference between an actual cost and its corresponding standard cost. Variances must be calculated at a sufficient level of detail to allow for useful cost analysis and control. If we continue with the Widget Lite example introduced earlier in this section, and determine that the Widget Company produced 45,000 widgets during the month of June for a total cost of \$1,900,000. The calculation of the total variance for the production of Widget Lite in June is as follows:

Table 7. Calculation of Total Variance for Widget Lite

Widget Lite Cost Analysis - Total June				
	Standard Cost	Actual Cost	Variance	% Variance
Total Direct Material	\$858,600	\$841,738	\$16,863	1.96%
Total Direct Labor	\$810,000	\$753,300	\$56,700	7.00%
Total Overhead	\$405,000	\$354,250	\$50,750	12.53%
Total	\$2,073,600	\$1,949,288	\$124,313	6.00%

Widget Lite Cost Analysis - Per Unit June				
	Standard	Actual	Variance	% Variance
Units Budgeted	33,333			
Units Produced		45,000		
Direct Material	\$19.08	\$18.71	\$0.37	1.96%
Direct Labor	\$18.00	\$16.74	\$1.26	7.00%
Overhead	\$9.00	\$7.87	\$1.13	12.53%
Total	\$46.08	\$43.32	\$2.76	6.00%

However, variance analysis is designed to answer two key questions – what is the difference between actual and standard costs, and why did the difference occur? The difference between actual and standard cost is relatively straightforward, as illustrated above. If actual costs are less than standard costs, the variance is *favorable*; if the actual costs are greater than standard costs, the variance is *unfavorable*.

The answer to the question of why the variances occurred requires a bit more calculation and analysis. There could be a number of reasons why the favorable variance occurred for Widget Lite in June, including:

The direct materials may have been purchased at a cost per unit less than the costs assumed in the standard. The plant may have been running at a particularly efficient level during June (no downtime, few vacations and therefore no temp workers, etc.) and therefore more Lite Widgets were produced per hour than normal.

For direct materials and direct labor, the variances are comprised of two components – a quantity variance (also called an efficiency variance) and a price variance. Quantity Variances are calculated as follows:

$$\text{Quantity Variance} = \text{Standard Quantity} - \text{Actual Quantity} \times \text{Standard Price}$$

Price Variances are calculated as follows:

$$\text{Price Variance} = \text{Standard Price} - \text{Actual Price} \times \text{Actual Quantity}$$

Therefore, given the following data about actual costs and actual quantities for Widget Lite, we can calculate the quantity and price variances for everything except Overhead as follows:

Table 8. Calculation of Direct Material Variance for Widget Lite

Calculation of Direct Material Variance for Widget Lite				
	Std Qty	Act Qty	Std Price	Variance
Steel	22,500	21,450	\$11.00	\$11,550.00 F
Gaskets	90,000	91,000	\$0.89	(\$890.00) U
Bolts	405,000	402,000	\$1.20	\$3,600.00 F
Paint	90,000	94,000	\$0.50	(\$2,000.00) U
Total Material Quantity Variance				\$12,260.00 F

	Std Price	Act Price	Act Qty	Variance
Steel	\$11.00	\$10.75	21,450	\$5,362.50 F
Gaskets	\$0.89	\$0.95	91,000	(\$5,460.00) U
Bolts	\$1.20	\$1.20	402,000	\$0.00
Paint	\$0.50	\$0.45	94,000	\$4,700.00 F
Total Material Price Variance				\$4,602.50 F

Total Material Variance				\$16,862.50 F
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As the summary table on the previous page shows, the total direct material variance for Widget Lite during June was less than 2% of “standard” cost. The variance analysis above shows that almost 75% of that total variance came from quantities used slightly less than the standard – primarily in steel. There were slight price differences between the actual cost per unit and standard, but savings in paint and steel costs were offset by higher costs for gaskets.

The Direct Labor Variance calculations are shown below. The calculations are the same as for materials, except variance due to the quantity difference in labor is called an efficiency variance rather than a quantity variance.

Table 9. Calculation of Direct Labor Variance for Widget Lite

Total Labor Efficiency Variance				
	Std Qty	Act Qty	Std Rate	Variance
Direct Labor	67,500	62,000	\$12.00	66,000.00 F
Total Labor Price Variance				
	Std Rate	Act Rate	Act Qty	Variance
Direct Labor	\$12.00	12.15	62000	(9,300.00) U
Total Labor Variance				56,700.00 F

This analysis tells us that the major contributor to variance was a significant reduction in the amount of direct labor required to produce Widget Lites. This is likely linked very closely to the fact that production was much higher than budgeted for the month, and it would take an examination of labor variances over a period of time to truly understand the issues behind this variance.

The calculation of the Overhead Variance is considerably more complicated – because the charge for overhead is itself based on an allocation process. In this case, overhead is allocated based on the number of Direct Labor Hours (at standard) required. Therefore, a variance in overhead costs could be caused by a number of factors:

1. Differences in the actual and budgeted costs of overhead items;
2. Differences in the actual amount of production and the budgeted amount used to determine the overhead rate per unit allocated; and
3. Differences between the actual amount of the allocation base (in this example direct labor hours) required per unit and the standard amount of allocation base.

Remember that in variance analysis we are trying to determine the difference between actual cost and the amount of standard cost that was actually charged to production. In the month of June for Widget Lite, this amount totaled \$50,750. The “F” denotes the variance is favorable to the firm. This represents that Total Overhead Variance and is calculated as follows:

Actual Overhead	Applied (Charged) Overhead
354,250	405,000
50,750 F	
Total Overhead Variance	

To go further with the overhead variance analysis, it is necessary to step back and understand the budget and actual performance of the individual components of Overhead for the month of June. Widget's budget and actual results for June are shown below. Note that this budget is split between Variable and Fixed Overhead, which allows for much more robust analysis of variances.

Table 10. Widget Lite Overhead Budget

	Budget June	Actual June
Variable Overhead		
Indirect Labor	65,000	80,000
Utilities	40,833	55,000
Maintenance	53,333	76,000
Total Variable Overhead	<u>159,167</u>	<u>211,000</u>
Fixed Overhead		
Supervision	28,333	28,000
Depreciation	50,000	50,000
Maintenance	25,000	25,000
Insurance	13,667	14,250
Property Taxes	<u>23,833</u>	<u>26,000</u>
Total Fixed Overhead	<u>140,833</u>	<u>143,250</u>
Total Overhead	<u><u>300,000</u></u>	<u><u>354,250</u></u>
Units	33,333	45,000
Direct Labor Hours (DLH)	50,000	62,000
Based on Budgeted Units and Standard DLH		
Variable OH Charge/DLH	3.18	
Fixed OH Charge/DLH	2.82	
Overhead Charge/DLH	6.00	
Overhead Charge/Unit	\$9.00	

The amount of Overhead allocated to Widget Lite for the month was calculated as:

$$45,000 \text{ Units Produced} \times \$9.00 \text{ Total Overhead Charge/Unit}$$

Many organizations choose to analyze overhead variances at a greater level of detail than just calculating the overall variance.

Two Variance Method

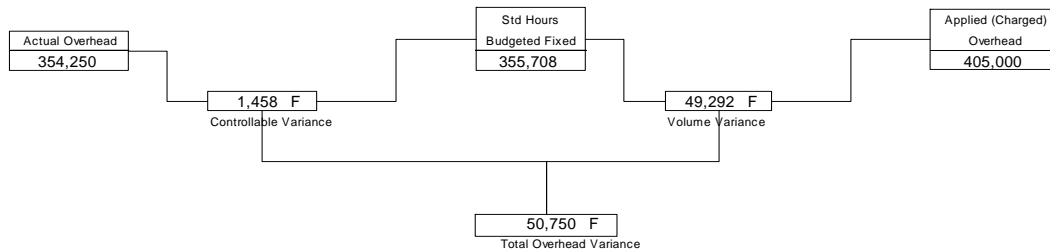
The Two Variance Method splits the overall overhead variance into two components – the “controllable” variance (that is controllable by management) and the “volume” variance – the amount of variance due to operating at an activity level that is different than the budgeted level. In order to compute these two variances, we need one additional calculation – the amount of overhead cost that would be applied if we used the budgeted variable overhead rate plus the total budgeted fixed overhead.

In this case, the calculation is as follows:

$$45,000 \text{ Units} \times 1.5 \text{ Hours} \times \$3.1833 \text{ VOH/DLH} + \$140,833 = \$355,708$$

This is the amount of overhead applied using Standard Hours and Budgeted Fixed Overhead. The difference between this amount and the amount of actual overhead is the controllable variance. The difference between this amount and the amount of overhead applied is the volume variance – the amount of favorable variance attributed to the increased activity for the month.

The two variance calculation is shown below.



Three Variance Method

The three variance method essentially splits the controllable variance into two components – a spending variance and an efficiency variance. Again, we need one additional calculation in order to compute this additional variance.

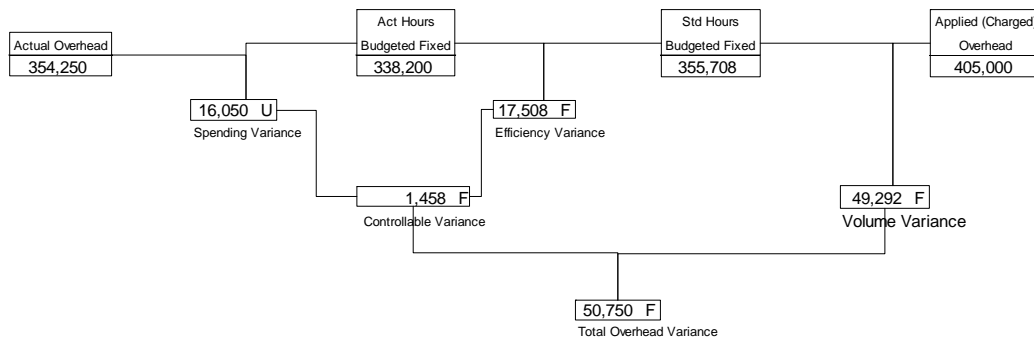
We need to compute the overhead allocation using actual hours (the actual allocation base instead of standard) and the budgeted fixed overhead.

$$62,000 \text{ Hours} \times \$3.1833 \text{ VOH/DLH} + \$140,833 = \$338,200$$

As you saw from the direct labor variance analysis, it only took 62,000 direct labor hours to make the 45,000 Widget Lite produced during June.

The difference between the calculation we just completed (actual hours, budgeted fixed) and the calculation we completed for the Two Variance analysis (standard hours, budgeted fixed) represents an Efficiency Variance – the amount that Overhead was less than applied due to more efficient use of direct labor. The remainder of the controllable variance is referred to as a spending variance – this is the amount that overhead items (variable and fixed) were different from their budgeted amounts.

The calculation of the Three Variance Method is as follows:



Extending the Spending Variance

The final extension of the overhead variance analysis can be performed by breaking the Spending Variance calculated above into the portion that relates to Variable Overhead and the portion that relates to Fixed Overhead.

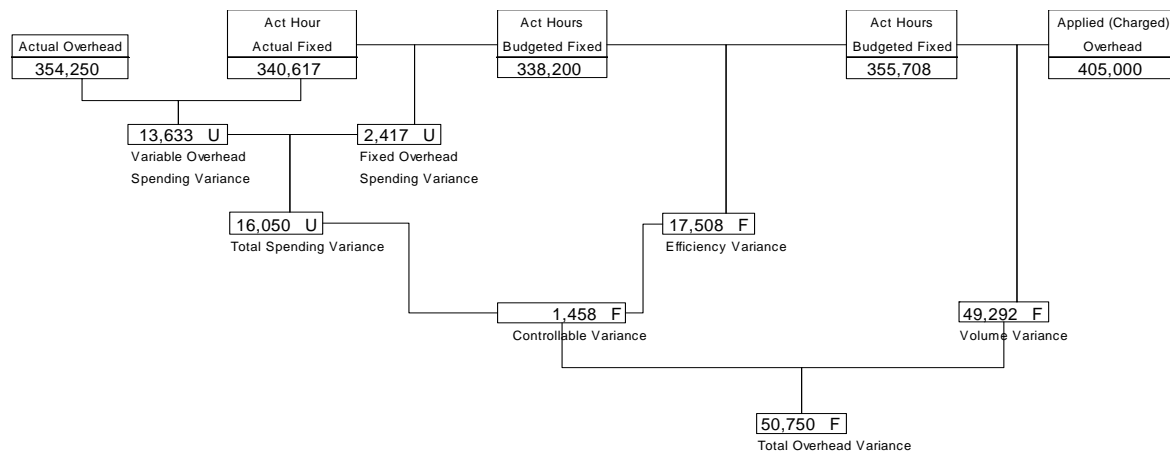
Again, we need one more calculation – in this case, calculating the amount of overhead that would have been applied if we had used Actual Hours and the Actual Fixed Overhead amount. The calculation is as follows:

$$62,000 \text{ Hours} \times \$3.1833 \text{ VOH/DLH} + \$143,250 = \$340,617$$

The difference between this amount and the Actual Hours, Budgeted Fixed amount is the Spending Variance related to Fixed Overhead (check this by looking back at the budgeted and actual fixed overhead discussed earlier).

The difference between the Actual Hours, Actual Fixed amount and Actual Overhead represents the spending variance on Variable Overhead Items.

The calculation is shown below.



What Happens to Variances?

In a standard costing system, production costs are charged to WIP, then transferred to Finished Goods Inventory, and finally to Cost of Goods Sold using the standard cost methodology. GAAP requires the inventories be recorded at cost, so all standard cost variances reflect the difference between actual cost and standard cost. Accordingly, on a periodic basis (and always before the generation of an external financial statement) variances must be “closed out” to WIP, Finished Goods, and Cost of Goods Sold based on the status of the products or services produced by the organization.

Applying Standard Costing Methodology to Agricultural Operations

The previous example attempted to illustrate how using standard costing can provide a great deal of information within the accounting system for use in determining cost behavior. Like many other features of managerial accounting, it allows management to break down differences in costs between controllable and uncontrollable, and allows them to be segregated according to manager responsibility.

Standard costing can be applied to both direct production costs and indirect production costs. Further, as you design your managerial accounting system, you can choose to utilize standard costing for one, both, or neither of these types of costs. In terms of applying standard costing to agricultural operations, the following points are worth consideration:

Standard costing for direct production costs. Utilizing standards for direct production costs is most useful when you have multiple transfer points in your production process and when the operating cycle is reasonably short. In other words, in a livestock operation with multiple stages (such as a swine operation), standard costing can be quite useful. For a crop operation with essentially an annual production cycle, the use of standard costing may be less useful. It may be preferred by the managers to conduct a detailed budget versus actual comparison on an *ad hoc* basis annually to understand the price and quantity differences incurred during the production process.

Standard costs for indirect production costs. Utilizing standard costs for indirect production costs (i.e., for operations support cost centers) can be quite useful if those support centers exist at a sufficient level of detail to allow an appropriate allocation base. For example, a crop operation with a machinery operations support cost center and a shop operations support cost center might choose to utilize standard costing (actually ABC) for allocation of machinery cost center expense to the various crop production cost centers. This is especially true when the operation is preparing external financial statements on a monthly or quarterly basis.

Transfer Pricing

One of the significant challenges in measuring performance of various segments of a business is the internal transfer of goods and services between those segments. There are numerous approaches to establishing the “Transfer Price” of internally transferred goods and services, but the three most common that we will discuss here include:

1. Actual cost
2. Standard cost
3. Market price

Probably the fourth most common approach is “Cost Plus” transfer pricing, but that in reality creates the same types of issues as if a Market Price approach is utilized.

When an organization establishes the responsibility centers appropriate for management assessment and cost evaluation, that process often addresses many of the common transfer pricing issues. In most cases, when a responsibility center is deemed to be a Cost Center (Production, Operations Support, G&A, or Finance), such designation has inherently assumed that management intent for that particular segment is to “focus on costs” – either because the manager responsible for that segment has no control over pricing decisions or because the segment is providing a support activity to a core business segment of the company.

However, in some cases the designation of a segment as a Cost Center or a Profit Center is difficult calls. For example, the case of a mixed crop and livestock operation that feeds approximately 50% of its corn and none of its soybeans creates a Grain Profit Center, a Corn Cost Center, and a Soybean Cost Center. The issue of how (and at what cost) corn is transferred to the livestock portion of the business (likely a Feed Cost Center) can then be worthy of considerable debate. The basic options are:

- Transfer corn from the Production Cost Center to the livestock segment at actual cost
- Transfer corn from the Grain Profit Center to the livestock segment at market value

(We have ignored standard cost as an option here because it will rarely be utilized for crops with an annual operating cycle)

It is relatively easy to put yourself in the shoes of the managers responsible for the Crop Profit Center and the Livestock Profit Center and come up with some good reasons for either approach. For example:

- Making me pay a full burdened cost for my corn understates the profitability of my segment because we have lots of excess capacity in our corn production system (equipment, grain handling, etc.). So long as I have to pay cost, there is no incentive for them to be a low cost producer of this product. In fact, I sometimes wonder if we had to sell our corn on the open market whether we would even be in the crop business. (Livestock Manager).
- We have a very low cost crop production system. Because a significant percentage of our crop production is merely transferred to the livestock segment at cost, this understates the contribution to overall farm profitability made by the cropping operation and overstates the profitability of the livestock segment. In fact, I sometimes wonder if we had to buy our corn on the open market if we would not be in the livestock business. (Crop Manager)

These are both common (if perhaps a bit overstated) concerns. What is even more interesting is that they sometimes are voiced by the managers on the same farm!

The reality is that regardless of which methodology is used for transfer pricing, the business must know the answers to the concerns raised by both of our hypothetical managers. Just because cost is used as the basis for transfer pricing does not mean that a segment manager should be ignorant of best practices and low cost production. Likewise, if a manager is benefiting from low cost transfer of inputs, he must be aware of the underlying competitiveness of his segment absent that low cost advantage.

The arguments for using alternative approaches for transfer pricing all have legitimate positives and negatives. Our purpose in this section is to highlight those trade-offs so that managers can make that appropriate choice for their own business and managerial accounting system.

Issues with Using Actual Costs for Transfer Pricing

The advantages for using actual costs for transfer pricing among segments of the business include the following:

1. Transactions are less complex within the managerial accounting system. There is no need to develop a system for determining market price in the absence of an actual sale, recording that price for each transfer, and then tracking the difference between market and cost so that it can be removed when external financial statements are prepared.
2. Downstream segment managers may have accountability for other parts of the business, but they still have responsibility to understand cost behavior of their inputs and identify opportunities for cost savings. Providing them with actual cost information on internally transferred goods and services allows them to fulfill this responsibility.
3. Managerial accounting information is different from capital budgeting (i.e., longer term strategy and pricing decisions). The relative performance and strategic fit of business segments must be constantly evaluated, but it needs to be with a longer term view than a typical accounting cycle.

The advantages to using a transfer price other than actual cost among segments of the business include the following:

1. Transferring at market insures accountability within the transferring segment to determine reasonableness of costs (normal versus abnormal) and does not let these costs be absorbed by other more profitable segments of the business. This issue is most relevant to excess capacity in the transferring segment – driving up costs that will quickly be revealed if a market based transfer approach is utilized.
2. Eliminates short term variations in cost that are not meaningful to the receiving entity.
3. Eliminates seasonal variations in cost that make transfer costs “lumpy” and difficult to compare from period to period.
4. It is easy for the receiving segment manager to understand and for senior management to evaluate true profitability of the segment on a standalone basis.

Treatment of Certain Marketing and Transportation Expenses

Conceptual Framework

Revenues are by definition an attempt to measure the “value” of goods or services provided by the business. Therefore, in most traditional financial reporting adjusting revenue for expenses that may be directly associated with an individual sale is the usual procedure, with two major exceptions – 1) discounts and returns and 2) allowances. Showing either of these items as production or operating expenses would in fact seem to be an inflation of revenues. In both cases, the amount paid for goods and services would be overstated.

However, expenses related to uncollectible accounts are never shown as an offset to revenue but rather as operating expenses. An uncollectible account is a bad debt expense related to a problem with the businesses billing and collection activity. It is not part of the pricing function.

The three expenses at issue are commissions, transportation, and check-off, which are grouped because they are often deducted from a producer’s check for livestock or crops delivered to a packing house or elevator. Details of the deduction are found on “settlement sheets” provided to the producer, but the check itself is for a

net amount. FFSC thinks the core issues involved with the classification of these expenses are related to materiality and cost/benefit, but other justifications for netting the amounts are also provided.

1. The check-off is a fixed amount over which the farmer has no control.
2. Some livestock and grains are priced on a “picked up” basis; therefore, the transportation is actually netted into the price. Other times the buyer is providing the transportation and actually including a charge that is deducted from the gross price on the settlement sheet. However, in this case, since the net price is really the one that matters, the amount this buyer chooses to charge for transportation is really irrelevant. If producers either provide their own transportation or hire third party carriers to deliver grain or livestock to the sale point, transportation cost is not netted in the settlement sheet.
3. Marketing commissions (such as those incurred at a sale barn for livestock) are directly associated with the sale, are essentially a “fixed” cost of the sale, and therefore are also an adjustment on the way to the true price of the commodity sold.

Basically, the core argument with all three of these expenses is that they are directly related to the sale, they are often already deducted in the price received by the producer, and they can, therefore, be viewed essentially as “services” included when the producer sells his output for the net price. While all these arguments are essentially true, FFSC believes they are not in themselves sufficient reason for adopting a netting approach for these expenses.

For example, a crop farmer signs up with one of the major seed/chemical companies to grow specialty grains for that company. As part of the deal, the farmer agrees to utilize his “partner’s” products for seed and chemicals, perhaps even at a discount. The partner goes even further to suggest that the farmer does not have to pay for those items until the grain is sold and will be happy to deduct them from the check paid to the farmer at settlement. Given that situation, this argument can be extended to suggest recording the grain sales net of the seed and chemical expense. It would seem to be a pretty significant stretch of the concepts to support that position.

The FFSC position on this issue is that revenue is revenue and expenses are expenses. In fact, check-off, transportation, and sales commissions are expenses involved in the production of revenue and should be shown as such. However, in the case where grain is sold on a “picked up” basis, the farmer does not need to estimate a transportation cost but would just record the revenue received and zero transportation cost.

As a final point, any manager must always consider both the materiality of a particular item as well as the cost and benefit of doing the separate recording identified. Check-off expense, for example, is for most commodities a very small expense and would probably be viewed as immaterial in most financial statements. Transportation and commissions, however, would, in almost all cases, be considered material amounts. For them, the issue is whether the cost of segregating the expense is worth the benefit of being able to segregate revenue from transportation and commission expense. Depending on the frequency of the transaction and the difficulty of sorting out the entry, managers may determine that such a separation is not worth the cost of doing it and choose to just record a single number as revenue. At the point of preparing external financial statements, the cost/benefit issue becomes less important than materiality, and a CPA must ultimately decide whether the materiality issue is sufficient to represent a departure from GAAP.

Summary of Position

1. The FFSC acknowledges that check-off costs, sales commissions, and certain transportation are often netted against the sales price of grain and livestock sold as part of the normal accounting procedures of grain and livestock buyers. However, the FFSC believes that understanding the amount of actual revenue received for products sold, as well as the components of marketing and transportation, are often important in the analysis of production and marketing results in a farming operation.
2. Accordingly, the FFSC recommends that, unless they are collectively immaterial in amount, these items be separately classified as operating expenses within the managerial accounting system of farm operations. Further, they should be shown in the S, G&A section of profit center reports and not as offsets to revenue.

3. Even when material, certain managers may feel the cost of segregating this information is not worth the benefit provided for managerial reporting purposes. For managers making this determination, they need to keep in mind the additional costs of segregation for external reporting (if consistency with GAAP is a goal or required) and for compliance with any commodity database requirements or consistency with external benchmarks.

Handling Land Related Transactions in Managerial Accounting

This segment of the guidelines provides a discussion of issues and options for tracking land transactions as a manageable cost component and/or investment center in the farm business. Some argue land should be set up as a cost center; others argue it should be set up as a profit or investment center. Both of these approaches can be useful for performance analysis depending on the nature of your business and your management intent. Before settling which approach is more appropriate for your application, it may help to examine some of the challenges, questions and issues that come to mind when addressing land use:

- What operating or strategic decisions must be made with respect to land, and what land investment performance variables can be measured to help make these decisions?
- Why is analysis of land costs so important?
- How can producers calculate or compare cost of production between or among different operations when operations have a diverse combination of owned land, cash rented land, and land leased on a crop share basis? What happens to management accounting complexity when an operation has a mix of these land use arrangements (owns, cash rents, and crop shares) and also has a diversity of commodity enterprises or profit centers?
- What alternatives can be used to address land costs as a component of cost of production? Should land be treated as a separate responsibility center (investment center, profit center, or cost center), or should land costs simply be addressed as transactional components in other production cost centers? Is it appropriate to look at land like other profit centers in terms of cost, revenues and assets devoted to a specific profit center?
- How should financial analysis handle land sales, capital gains and losses, and annual appreciation gains that show up in market based financial statements? A related analysis question is whether management accounting should generate information useful for analyzing debt servicing capacity associated with land investments and borrowings.
- Is land investment analysis a managerial accounting issue, or is it more appropriately addressed as an economic analysis issue performed outside the transaction-based managerial accounting system? Should managerial accounting guidelines provide a path to connect these two analysis systems?
- How would a land investment, cost, or profit center be structured and what transactions would logically flow to this center?

Decisions that Impact Land Acquisition and Use and Performance Variables Needed to Make These Decisions

One of the foundation tenets concerning managerial accounting is that its primary purpose is to *support decision-making*. What kinds of decisions are commonly made concerning land use? The following are common operating and strategic decisions farmers must make concerning land:

- Buy, rent, or custom farm?
- How much to pay to either rent or buy land (under the presumption the price paid should result in a profitable investment decision and also cash flow itself)?
- What is the optimal scale of operation and how do land access options help work toward this goal?

- How do government programs specifically tied to a parcel of land impact its value and rent potential (i.e., program crop base acreages and proven yields), and how will the proposed future use and management of the land impact payment eligibility?
- What land uses will generate the best return on assets – i.e., crop rotations, tillage strategies, livestock grazing, recreation or commercial development?
- Should owned land be operated by the owner or rented out to someone else?
- Should land be sold or re-directed to another non-farm use?
- How do we manage government programs that add environmental costs and also provide revenue for selected crop, livestock and environmental purposes?

Managerial information and performance variables that are useful when making each of these decisions include:

- Net return to land investment
- Productivity per unit (i.e., yield potential or carrying capacity)
- Price in relation to productivity (i.e., per acre cost in relation to bushel yield; value per acre versus pounds of gain per acre per day)
- Cost per base unit and unit of production to own or lease (i.e., cost per acre/cost per bushel; cost per cow/cost per pound of beef or cwt of milk produced)

Using Management Intent to Determine How to Structure Land Cost Centers or Profit Centers

The first performance variable, *Net Return to Land Investment*, is a critical measure of land investment performance. This performance measure requires analysis of annual operating returns as well as long-term appreciation or capital gain returns (or capital losses).

The measure a manager chooses as the primary focus of analysis hinges partly on management's intent. Is the farm manager's investment goal to operate the land or to rent or lease the farm to another farm tenant? In looking at *annual operating gains*, if management's intent is operate the farmland, "Return to land is calculated by taking gross receipts and subtracting all production expenses, except interest on the land investment and interest and depreciation on assets included with the land sale."¹ Where management's intent is to rent rather than actively farm the land, "...returns to land may be estimated by taking total rent received minus ownership costs such as property taxes, repairs and insurance, but again exempting interest and depreciation."

Ideally, if a farm manager is interested in evaluating performance of sub-segments of the business, it is critical to differentiate *operating returns* from *capital gains or appreciation returns*. Inflation, technology, government regulation and commodity price support programs often drive appreciation. Hybridization, biotechnology, and no till efficiencies are examples where improved yield potential or cost efficiency have provided a positive thrust in land values. Values have also been impacted negatively by restrictive regulations (i.e., environmental restrictions), weather impacts (droughts, drop in water tables), global competition driving market prices downward, and reduction in government supports or subsidies.

Total returns to land investment are the sum of the above two components of earnings:

$$\text{Net Annual Return from Land} = \text{Annual Operating Return} + \text{Appreciation}^*$$

* *Appreciation = Increase in market value of assets net of deferred tax changes*

The Earned Net Worth Dilemma – Implication for Management Accounting

Producers preparing annual financial statements commonly adjust land values to reflect current market values. The current market value of selected assets (particularly land, equipment and improvements) often differs substantially from a producer's cost basis. In those cases the balance sheet should reflect the deferred gain or loss from market appreciation and also show the deferred tax liability on the unrealized taxable gain.

¹ These definitions are quoted from *Analyzing Land Investments* written by Gayle Willet as one of the videotape training modules included in the Business Management in Agriculture series.

Appreciation gains create a challenge for analyzing farm profitability performance and reconciling earned net worth changes. From a management accounting standpoint, appreciation also poses a challenge: how do you factor in land appreciation gains in calculating cost of production? Is land appreciation commodity revenue...or is it an adjustment to production costs? If you consider land costs as a key factor of production costs, then it would follow that appreciation gains could be considered a partial recovery of production costs.

Why Separate Land as a Responsibility Center?

One of the questions explored in this discussion is whether to include land as a separate responsibility center. A primary reason to establish a separate center is that there is a significant amount and frequency of transactions that warrants separate management of a key cost input to the business. Another benefit of having a separate land center is it provides an analysis center separate from the commodity profit center to record annual land appreciation gains (or devaluation losses). It also provides a location for recording gains or losses on land sales that have nothing to do with production activity.

The commodity operating margin would show in the profit center for one or more commodities produced. The appreciation gain associated with land investment could be shown as one of the revenue components of the land investment center. The total net worth change that arises from operational gains versus appreciation could be identified in the two different management segment analyses. More discussion on this issue will be covered later.

Comparing Cost of Production with Different Land Ownership and Rental Arrangements

If a farm's entire land base is acquired through cash rent, analysis of the land cost as a component of overall production costs is fairly simple. Rent is simply included as one of the fixed production cost elements. If land is acquired through a crop share arrangement or a combination of cash rent and crop share arrangements, the analysis becomes more complicated. A key concept in managerial accounting for agriculture is driving producers toward uniform methods of recording and analyzing transactional data that will allow comparability of analysis in the industry. Different land ownership and rental arrangements create a significant challenge when trying to create comparable industry data. The following questions arise:

1. How do you calculate, benchmark or compare cost of production when one operation owns land and another rents, or one farm cash rents and another has a crop share lease?
2. What happens when an operation has a mix of these land use arrangements (owns, cash rents, and crop shares)?
3. When we talk about the impact of land cost on cost of production, how do we compare costs between a farmer who inherited land at zero cost basis versus a farmer who just paid \$3,500 an acre for prime Midwest farmland?

Several scenarios can be simulated to contrast how alternative land access arrangements impact profit center and cost of production analysis. For illustration purposes refer to Table 11 – *Land Center Example* which compares four alternative land ownership and rental arrangements. The four scenarios compared are as follows:

1. 100% of acreage is owned
2. 100% of acreage is cash rented
3. Crop acreage is partially owned and partially cash rented
4. 100% of acreage is farmed on a crop share lease basis

Table 11. Land Center Example

	Own 100% of Acres Farmed			Cash Rent 100% of Acres Farmed			Combination: Own & Cash Rent			Crop Share 100% of Acres Farmed		
	1250			1,250.00			750.00			-		
	0			0.0000			500.00			-		
Acres Owned:	0			0			0			0		
Acres Cash Rented:	0			0			0			0		
Acres Crop Shared/Landlord Share	0			0			0			0		
Marketable Bushels-Operator Share	0.0000			0.0000			0.0000			0.0000		
	Amount	100,000 bushels	\$/Bu Prod	Amount	100,000 bushels	\$/Bu Prod	Amount	100,000 bushels	\$/Bu Prod	Amount	100,000 bushels	\$/Bu Prod
1 Total Commodity Revenue	\$ 311,000	\$ 248.80	\$ 3.11	\$ 311,000	\$ 248.80	\$ 3.11	\$ 311,000	\$ 248.80	\$ 3.11	\$ 207,344	\$ 165.87	\$ 3.11
2 Total Direct Production Costs	\$ 83,750	\$ 67.00	\$ 0.84	\$ 83,750	\$ 67.00	\$ 0.84	\$ 83,750	\$ 67.00	\$ 0.84	\$ 83,750	\$ 67.00	\$ 0.84
3 Total Production Costs-Indirect	\$ 89,600	\$ 71.68	\$ 0.90	\$ 177,100	\$ 141.68	\$ 1.77	\$ 124,600	\$ 99.68	\$ 1.25	\$ 89,600	\$ 71.68	\$ 1.34
4 Total Dir and Ind Prod Costs (2+3)	\$ 173,350	\$ 138.68	\$ 1.73	\$ 260,850	\$ 208.68	\$ 2.61	\$ 208,350	\$ 166.68	\$ 2.08	\$ 173,350	\$ 138.68	\$ 2.60
5 Production Margin (Line 1-4)	\$ 137,650	\$ 110.12	\$ 1.38	\$ 50,150	\$ 40.12	\$ 0.50	\$ 102,650	\$ 82.12	\$ 1.03	\$ 33,994	\$ 27.19	\$ 0.51
6 Total SG and A Expense	\$ 31,000	\$ 24.80	\$ 0.31	\$ 26,000	\$ 20.80	\$ 0.26	\$ 29,000	\$ 23.20	\$ 0.29	\$ 26,000	\$ 20.80	\$ 0.39
7 Total Operating Costs (4+6)	\$ 204,350	\$ 163.48	\$ 2.04	\$ 286,850	\$ 229.48	\$ 2.87	\$ 237,350	\$ 189.88	\$ 2.37	\$ 199,350	\$ 159.48	\$ 2.99
8 Operating Margin (line 1-7)	\$ 106,650	\$ 85.32	\$ 1.07	\$ 24,150	\$ 19.32	\$ 0.24	\$ 73,650	\$ 58.92	\$ 0.74	\$ 7,994	\$ 6.39	\$ 0.12
Other Expense (Income)												
9 Interest Expense	\$ 83,000	\$ 66.40	\$ 0.83	\$ 5,000	\$ 4.00	\$ 0.05	\$ 51,800	\$ 41.44	\$ 0.52	\$ 5,000	\$ 4.00	\$ 0.07
10 Govt Pmts-PFC/AMTA	\$ (18,750)	\$ (15.00)	\$ (0.19)	\$ (18,750)	\$ (15.00)	\$ (0.19)	\$ (18,750)	\$ (15.00)	\$ (0.19)	\$ (12,501)	\$ (10.00)	\$ (0.19)
11 Total Other Expense (Income) (line 9 + 10)	\$ 64,250	\$ 51.40	\$ 0.64	\$ (13,750)	\$ (11.00)	\$ (0.14)	\$ 33,050	\$ 26.44	\$ 0.33	\$ (7,501)	\$ (6.00)	\$ (0.11)
12 Margin After Other Inc/Exp (line 8-11)	\$ 42,400	\$ 33.92	\$ 0.42	\$ 37,900	\$ 30.32	\$ 0.38	\$ 40,600	\$ 32.48	\$ 0.41	\$ 15,494	\$ 12.40	\$ 0.23
13 Opportunity Land Charge*	\$ 87,500	\$ 70.00	\$ 0.88	\$ -	\$ -	\$ -	\$ 52,500	\$ 42.00	\$ 0.53	\$ -	\$ -	\$ -
14 Family Living Draws*	\$ 30,000	\$ 24.00	\$ 0.30	\$ 30,000	\$ 24.00	\$ 0.30	\$ 30,000	\$ 24.00	\$ 0.30	\$ 30,000	\$ 24.00	\$ 0.45
15 Margin After Opp and Living Costs	\$ (75,100)	\$ (60.08)	\$ (0.75)	\$ 7,900	\$ 6.32	\$ 0.08	\$ (41,900)	\$ (33.52)	\$ (0.42)	\$ (14,506)	\$ (11.60)	\$ (0.22)

* Opportunity Charges are included for illustration, only. This is not an analytically correct practice as cost elements related to land and family living costs are already included in total unit costs.

The first four scenarios simulate gross revenues and costs, dollars per acre and dollars *per bushel of total grain produced on the farm*. The fifth column is similar to the fourth in that both represent a 100% crop share lease arrangement. The difference is that the fifth scenario uses *dollars per bushel available to market* as the factor to integrate physical production units with cost of production. Practitioners often debate the following two questions when analyzing production costs involving crop share arrangements:

- Should the divisor for calculating dollars per unit of production be total production or only the operator's share?
- To do consistent comparative analysis, which of the following practices is better?
 - Include the value of the landlord's share of production at a market price in the revenue section and include a similar value for the landlord's share in production costs as a proxy for rent, or
 - Include only the operator's share of production available to market in revenue, and show no value in production costs for landlord's crop share rental.

On the first question concerning which divisor is appropriate, when scenarios four and five are contrasted, revenue per bushel makes more sense in scenario five, where total revenue is divided by marketable bushels. But costs per bushel for individual cost components or line items are significantly higher, when compared to ownership and cash rental arrangements. Should that be the case? "Yes" is the correct response. Under crop share arrangements, the operator has fewer bushels of production to allocate costs. But the crop share tenant also does not incur cash rent or real estate mortgage interest expense typically found under the cash rental and ownership arrangements.

Looking at production cost figures on a per acre basis provides a meaningful performance indicator for budgeting, benchmark comparisons, and standard costing (if that practice is used to allocate production costs). The production cost number that is perhaps most critical to compare under these different arrangements is line 8 – Total Operating Costs. The Case Exhibit shows a fairly tight range in total costs ranging from \$2.87 to \$3.07 per bushel (ignoring the fourth scenario).

Concerning the second debate question, grossing up revenue to include both the operator's and landlord's share of production and inserting the value of the landlord's share as rental expense may appear to make comparative analysis easier. However, this practice has several pitfalls:

- The landlord's share of production is not accessible to the producer to market and has no transaction-based vehicle for moving these values into the accounting system. (A user could use a transfer pricing process to set up these transactions, if he so chose.)
- Grossing up revenue and creating an offsetting rent expense at some assumed commodity value masks the true financial representation of marketing and production cost risk. Managers often choose a crop share lease arrangement to share the production risks and rewards with the landlord. Risk sharing can involve revenue only, or it can involve sharing both revenue and costs. The case

illustration shows a 1/3 crop share with no direct sharing of input costs. In real practice many landlords also pay shares of direct and some indirect production costs usually in the same ratio as they share in the crop.

One of the primary reasons for driving managerial reports to calculate a per unit cost of production (UCOP) is to allow the manager to compare UCOP to market opportunities. The goal, generally, is to market at a price that will yield a profit. In the case example, at a price per bushel of \$3.11, the 100% crop share farm has a \$.04 operating margin after total operating costs are paid. Non-production related income from government payments adds another \$.19 per bushel, which brings total margin per bushel up to \$.23 per bushel.

What other comparisons can be made from this example? One could conclude that based on the margins reflected on line 11, ownership is the best approach (\$.42 margin), followed by 100% cash rent (\$.38 margin). The crop share lease only shows a \$.23 margin. Stopping at this level of analysis might appear to ignore two critical analysis issues—opportunity land cost charges for land rent and an imputed family living charge to cover family labor provided that is not already covered in direct and indirect production costs:

1. **Opportunity Land Cost Charges** – The 100% ownership scenario doesn't include any opportunity cost for the land owned. You might ask, "Is it appropriate to simply assess an opportunity land charge at the "going rate" for land rent (as the Exhibit has arbitrarily done at the bottom of the report)? The answer is, "Not necessarily." Including this opportunity cost tends to double count total costs, as land costs are already partially reflected in mortgage interest, real estate taxes and casualty insurance on buildings and improvements. Huge differences can show up in costs per bushel depending on whether an operation is highly leveraged or debt free. Differences can be clearly seen by comparing financing costs, when similar ownership or rental arrangements are compared. The differences are harder to interpret when land acquisition arrangements are mixed.
2. **Family Living Labor Proxy** – If the operation is a proprietorship and family living costs are considered a reasonable proxy for the value of the owner's management and labor, the crop share operator experiences a much higher cost per bushel to carry the overhead. Assuming a \$30,000 family draw represents a reasonable proxy for Family Labor, note that the crop share operator in the case has a \$.45 cost per bushel overhead load to pay for Family Living, while the owner and cash renter each have only a \$.30 overhead burden per bushel. Analyzing these same factors on a *per acre basis*, however, yields a similar number for both operations. This is more meaningful benchmarking tool for looking at comparative cost efficiency from one operator to another. **Caution:** Assigning a large number for family living may not be a valid economic analysis if many of the costs associated with supporting family labor are already buried in direct and indirect production and overhead costs.

Dealing with Production Cost Comparisons Where There Are Significant Differences between Land Cost and Market Values

This discussion addresses the third question raised earlier. Regardless of the what the land is worth, the cost driving what each operator must have from the market to make a profit is tied to what he has invested (at cost) in the land. The farm owner who acquired the land with a low basis will have a land cost advantage over the farm owner who recently purchased land at a significant current market premium. Consequently, the price the former farm needs to be profitable will be lower.

Whether each could do better by selling, leasing or redirecting their land resources to another investment is an economic analysis issue that is aside from calculating historic cost of production using managerial accounting.

Why Analysis of Land Costs Is So Important

Land costs can be a significant portion of the total cost of production, typically representing 30-40% of total production costs. The ratio of total land costs to total cost of production varies substantially depending on the commodity produced. In a crop operation or cow-calf operation the ratio of land base to revenue can be very significant. In a farm related service industry, or a production facility, land may not be a significant ingredient in the cost structure. The significance of the land investment base in the total resources mix has a direct bearing on whether land costs materially influence cost of production.

The table below extracts costs from the three different case scenarios discussed earlier. In the crop share lease situation, the absence of a direct outlay for land rental costs or mortgage interest expense is generally offset by a higher per unit cost of other direct and indirect costs. This results from spreading many of the same direct and indirect costs over a reduced level of production, after the landlord's share is taken out of the pot.

Table 12. Cost Per Bushel Analysis

Cost Component	100% Owned	100% Cash Rent	100% Crop Share
Land rent expense	\$0	\$0.88	\$0
Property taxes (real estate only)	\$0.05	0	0
Mortgage interest	\$0.78	0	0
Total Costs	\$0.83	\$0.88	0

Should We Use an Investment Center or Cost Center to Track Land Transactions?

Arguments can be made that land can be an investment center or a cost center. Earlier in this document, four purposes for managerial accounting analysis were identified:

1. Personnel/area performance measurement
2. Revenue/profitability measurement
3. Asset management/utilization
4. Cost control

Costs of land acquisition, rental, and/or lease have a major impact on profitability, asset utilization, and cost control. The financial manager has to make trade-offs between the pros and cons of ownership versus renting or leasing. Owning provides: security of land access, a hedge against inflation, and a steady source of revenue. Leasing or renting has other benefits: it allows access to capital where equity is limited, it reduces capital investment in relation to revenue produced (thus increasing capital asset turnover), and it provides flexibility in accessing land resources. Part of the issue concerning whether to analyze land transactions in a Cost Center versus an Investment Center revolve around the issue of managers desire to have both cost analysis information as well as economic/opportunity investment analysis.

Where Does Investment Analysis or Economic Analysis fit in with Managerial Accounting in Land Related Issues?

Managerial accounting and economic analysis are different analytical approaches and access different information. A discussion earlier in this draft brought up the issue of considering an opportunity land charge as part of the analysis. This is an economic concept, not an accounting transaction-based cost. If designed properly, managerial accounting reports should provide clearly differentiated cost elements related to land use. Financial transaction costs such as rent, lease, property tax, building fire and liability insurance, and expenses related to permanent improvements to land such as tiling, terrace maintenance, etc. should be clearly decipherable in the managerial accounting report. Other analytical programs designed to analyze investment performance or simulate feasibility of land purchase decisions can then be used effectively by extracting selected actual accounting data from the managerial reports.

Alternatives for Structuring a Land Cost Center

If a manager deems it appropriate to isolate land related transactions in a land cost center, guidelines should address the following:

1. Structure of the responsibility center report
2. Definition of transactions that would typically flow to this center
3. Alternative methods for allocating costs to other cost or profit centers

The land cost center should reflect the same basic design as other responsibility centers. This suggests a basic format that would include:

1. Revenue
2. Direct costs
3. Indirect costs

The next step is defining what transactions would naturally flow to this account. The following are potential transactions related to land cost centers.

1. Land purchases and sales (These are balance sheet/cash flow transactions. They are not income/expense related and not relevant to cost center transactions that factor into inventory values or cost of production.)
2. Amortization of commission fees
3. Real estate taxes and insurance
4. Capital gains and losses resulting from land sales
5. Valuation changes in market value balance sheets
6. Debt service costs associated with land investments
7. Land management fees
8. Professional fees – appraisals, surveys, etc.

A sample Land Cost Center could contain the following elements:

Revenue	Production Costs
Capital gains income-land sales	Cash rent
Cost share reimbursements – (government and non-government) for conservation improvements	Real estate and improvements property taxes
Conservation easements income	Casualty and fire insurance
Hunting recreational revenues (assuming this is an incidental income and not a “for profit” enterprise)	Facility and land improvement costs
Rental Income on land assets leased to others	Conservation and land improvement costs
Current year increases in market value of real estate	Commissions on land sales
Current year unrealized appreciation of buildings and improvements	Professional fees paid on land transactions
Fixed government subsidy payments tied to the land base (non-commodity focused)	Lease renewal expenses
	Land management/property management fees
	Net land cost center (revenue) costs

Allocation of Land Costs to Production Cost Centers

The final step is to determine ground rules or allocation formulas for allocating land costs to various production cost centers. This could be accomplished a number of ways.

1. Allocate based on a pro rata assignment to specific production cost centers based on the percentage each crop represents of the total acreage. This method could work well for the pure crop operations with no significant land resources dedicated to other enterprises such as livestock, timber or wildlife/recreation.
2. Allocate based on pro rata share of revenue generated from each commodity. This follows the “capacity to pay” theory. This is only appropriate if management believes the drivers of land cost are directly proportional to the income productivity of the mixed land base as a whole.
3. Allocate based on cost or market value of specific assets assigned to each commodity or commodity group. This approach might fit well with a grain and livestock operation where land asset bases and related costs can be clearly segregated between the two groups. A first level allocation would assign appropriate land costs to livestock versus crop operations. Then, a second level allocation could be used to allocate within these groups: livestock segments could be broken down to multiple production cost centers; and crop related land costs could be allocated using the technique in the first option listed above.

Challenges Created by Extraordinary Gains and Losses on Real Estate Transactions

One problem that can arise if gains and losses are included in land cost center revenues is that it can result in considerable “lumpiness” in production costs in a given year that could materially distort normal production costs. This creates a challenge when the management team is trying to assess long term trends in production costs; it also makes it difficult to market commodities based on a margin objective over normal production costs. One solution to this challenge is to only include in the land cost center normal expenses and cost recovery items, and then include significant capital gains or losses in “Other Expenses and Income” – a separate cost center that is not allocated to the various production cost centers.

Land as an Investment Center

Managers may also choose to track land transactions in an investment center rather than in a profit center. The basic distinction between a profit center and an investment center is as follows:

A profit center tracks revenue and costs related to base units of production. The primary focus is profitability. An investment center tracks revenue and costs tied to specific assets. The primary focus is return on assets invested.

Tracking land transactions in an investment center may be a good practice where land ownership and managing returns to the land is the key focus of management intent, rather than producing a commodity for profit. It also fits well for those managers who freely consider selling or redirecting use of land to alternatives that increase net returns.

This approach is less appropriate where management intent is to grow grain or livestock for profit, and land-related costs are just one of many cost components that must be managed in overall cost of production. In this case, managers can still track land costs in a cost center and use investment/opportunity cost analysis to consider alternative investment or use strategies.

There are several issues and challenges related to investment center design:

1. How do you define which assets should be tied to the land investment center? Raw land specifically dedicated to a production enterprise is not too difficult, but how do you deal with specialized facilities that may have multiple uses and support multiple commodities? What about costs and returns incidental to the core business (e.g., related to farm woodlands)?

2. Establishing a land investment center normally involves establishing a transfer price to reflect a standard cost for owned land used in the business. A common practice is to use fair annual rental in the area as a proxy for the transfer price on owned land. A challenge in this process is to avoid manipulating return on assets when rental arrangements vary significantly in a production region. Arriving at a fair land charge on owned land brings into the play all the issues of what is a fair price to use for transfer pricing. (See Transfer Pricing discussion in the Managerial Accounting guidelines.)
3. Once you have a net margin in the land investment center, what do you do with it? Does this become an end result, or is this net gain then transferred as an allocated item to the commodity production cost centers to arrive at an adjusted cost of production?

System Interrelationships and Implications of Land Cost Allocations to Responsibility Center Managers

A major reason for accumulating management information is to assess personnel performance and empower quality decision-making. Allocating land costs helps the marketing manager see the big picture on total costs that need to be covered to market at a margin. But land costs are not necessarily the responsibility of the marketing manager. These costs may also not be the responsibility of the crop production manager. The crop production manager is normally focused on maximizing yield and minimizing direct-input production cost per unit. If the production manager is not responsible for purchasing land, arranging financing terms, or negotiating leases and rentals, then it doesn't make sense to accumulate land costs directly in a production cost center that is primarily controlled by the production manager. Accumulating land costs in a separate responsibility center provides an opportunity for the person in charge of managing land acquisitions and lease negotiations to focus on the decisions that go with that manager's area of responsibility.

Another benefit of tracking land costs in a separate center surfaces when faced with multiple enterprises and diverse rental/ownership. A separate cost center allows the manager to accumulate costs associated with both owning and renting or leasing land into a common pot, which can then be distributed in the form of a blended land cost back to individual cost or profit centers. As farm operations become more complex, they often have expanded crop enterprises in the rotational mix, and they entail a wide variety of land access arrangements. Whether the analyst is evaluating past performance or projecting pro forma income and doing budgets, a key issue is looking at margins over direct and indirect costs. As rotational complexity increases the analytical emphasis starts shifting to the performance of the crop rotation *system*, tillage *system*, and mix of inputs, rather than a focus on a *specific commodity production cost or margin*. Agriculture producers are being pressured globally to pursue more environmentally sustainable as well as economically viable cropping management systems. These pressures are leading to increasing complexity in the following cropping management systems:

1. Rotation management and biodiversity
2. Pest and nutrient management
3. Tillage and residue management

Management accounting systems that innovatively design responsibility centers that take these "system" factors into consideration will be critical for future production managers. One shortcoming of traditional enterprise analysis was that the synergies and conflicts of crop rotations could not be clearly segregated in the separation of revenues and costs for each commodity raised. For example, a farmer raising winter wheat following spring peas in a 20" rainfall zone in the PNW can typically raise higher yields of winter wheat than a grower re-cropping winter wheat year after year. Is this because of the reduced moisture used by the pea crop...or is it the added fertilizer that the pea (legume) fixes in the soil...or is it the improved soil quality that results from the rotation overall. Farmers also find growing an oilseed crop in rotation with small grains has significant benefits to reducing disease and enhancing soil quality. Unfortunately, the profit center calculations for each of these crops might show a significant margin in wheat and a breakeven at best for peas and oilseeds.

Does this mean the farm should quit growing peas and canola and find a better way to just grow wheat? Not necessarily. The value of management accounting in this case is identifying *for all the components in your cropping management system* what the proportional contribution of profit margin is for each crop in the system. When studied over time, ideally each production manager will adopt an optimal rotational mix of crops that:

1. Achieves a *blended margin over the rotation* that exceeds other alternative rotation systems,
2. Meets managements targets for return on assets and equity, and
3. Allows the production factory (i.e., soil quality) to stabilize or gradually improve in overall productive and environmental capacity.

Another danger of management accounting related to this systems discussion is placing too much stock in analysis of commodity production cost cycles for only short periods of time, rather than following performance through high, medium and low cycles of prices, weather, etc. For example, if either of the above mentioned rotations were pursued in semi-drought conditions, the wheat production may pencil out as significantly higher cost of production due to low yield than a competing neighbor who fallows every other year. Does that mean we jump out of the rotation and change cropping systems? Not necessarily; these conditions warrant a longer term management analysis to project how these management systems will perform under normal conditions. Then one must ask if the operation has the risk taking ability to handle the extremes when weather or pricing cycles place one component in the system in an extremely unprofitable situation.

Summary

Analysis of land costs is extremely important as it often represents one of the largest cost components in total production costs.

Managerial accounting can benefit from developing responsibility center reports related to land acquired under alternative ownership and lease/rental arrangement.

Land cost/profit centers can serve a useful purpose in providing a repository for land related activity including:

- Revenue – Capital gains income from land sales, unrealized appreciation (devaluation) of real estate, buildings and improvements.
- Production Costs – Cash rent, real estate and personal property taxes, casualty and fire insurance.
- Other Expenses – Commissions on land sales, professional fees paid on land transactions, lease renewal expenses, and land management fees such as property management fees.

There are many variables used to measure land investment performance. It is particularly important to isolate gains and losses that arise from annual operating gains versus appreciation or capital gains.

Comparing cost of production among different farm operations is a challenging exercise especially where different land ownership and rental arrangements exist. Analysis and comparability are further complicated by diversity in enterprise mix.

Design and content of a separate land cost center report can aid in carrying out the intent of management information to assess personnel and area performance, profitability, asset utilization, and cost control. A separate land cost center can also provide a useful tool for reconciling changes in market value net worth where unrealized gain in real estate is a significant issue.

Classification of Certain Revenue Transactions

Most income and expense transactions can be clearly identified as a primary revenue source or a cost of production transaction. For example, sale of wheat or corn in a grain farm is easy to identify as primary income that could be assigned directly to a grain profit center. A direct payment for seed, fertilizer, labor or fuel expense is normally identified as a direct production expense as it can be assigned directly to a grain production cost center. However, many transactions are not as easily categorized.

On the revenue side, for example, operations generate a number of incidental income transactions in the normal course of managing their operations. These incidental transactions may or may not tie directly to the primary commodity raised. Operations also receive income that is not really true farm income or value of farm production. It is actually a recovery of production or other operating costs. Conversely, farmers often write checks for transactions that are adjustments to income as opposed to a production cost or expense.

To record these unusual transactions in a manner that will insure a logical result in the managerial report formats, the person handling the transaction must understand

1. Management's intent concerning profit and cost centers to be managed and tracked;
2. What characteristics cause a transaction to be classed as income, income adjustment, expense, or expense adjustment (cost recovery);
3. How to allocate these transactions in the managerial accounting system to facilitate standardization in data accumulation and interpretation for decision-makers and responsibility center managers.

Twelve case studies are used to illustrate the classification of revenue transactions.

Case A – Equipment rental income - rental income is limited in activity and not intended to be a major responsibility or profit center to be managed.

Case B – Sale of surplus machinery repair parts – farmer sells parts from inventory previously expensed as Machinery and Equipment Repairs and assigned to the Machinery Cost Center.

Case C – Year-end quantity discount check – discount check is received based on volume of fertilizer and chemical purchases for a given accounting period.

Case D – State and federal fuel tax refunds – refunds are tied directly to fuel purchased with tax included where tax is refunded due to use exemption.

Case E – Sale of raised wheat for seed – farm sells raised wheat seed to neighbor at significant premium over raw commodity value.

Case F – Custom hauling landlord and neighbor's grain – activity is limited in scale and not intended to be tracked as a commercial trucking operation.

Case G – Government Payments – farm receives a variety of government payments.

- *AMTA/MLA* – payments are made on a whole farm basis at set rates per bushel of eligible base acres; payments are not directly tied to production of a crop.
- *LDP (Loan Deficiency Payment)* – payments bear a direct relationship to bushels or pounds of commodity raised and are an integral part of the total price received for the commodity.
- *Conservation program cost share payments* – payments are received as direct compensation to the farm as reimbursement for costs incurred to perform various conservation practices or to install permanent conservation structures.

Case H – Reimbursement from landlord – landlord pays share of fertilizer and chemical.

Case I – Sale of excess hay to neighbor – farm is primarily in the cattle business and only sells hay on incidental basis.

Case J – Sale of cull cows.

Case K – Receipt of crop insurance proceeds.

Case L – Receipt of income from commodity by-products.

Case A – Corn/Soybean Farm Generates \$20,000 per year in Equipment Rent

Farm operation has established two profit centers (corn and soybeans), two production cost centers (corn and soybeans) and an operations support cost center for machinery. The farm rents out selected equipment on a per hour or per acre basis to increase the utilization efficiency of the equipment. Management's intent is to farm and not to operate a main line equipment rental enterprise.

Managerial Accounting Questions: (1) Does the equipment rental income add to the crop profit center revenue per bushel? Or, (2) Should the rental income be shown as a partial recovery of costs in the equipment cost center, thereby lowering unit cost of production?

Suggested Treatment. This revenue is best handled as an adjustment or recovery of production expenses. The rental income has nothing to do with the value of the crop raised or produced. Consequently, by including this income in crop revenue, it distorts the revenue per acre or per bushel. The costs associated with the equipment being rented (ownership, maintenance, etc.) are included in the direct and indirect equipment production costs.

The suggested treatment is illustrated in the following example of a 2,000-acre Grain Farm with a 50/50 corn/soybean rotation. Yields were 125 and 35 bushels respectively for corn and soybeans.

Equipment Cost Center	Total Cost	\$/Acre	Corn \$/Bushel	Beans \$/Bushel
		2,000	125,000	35,000
Revenue				
Equipment Rental Income	20,000	10.00	0.08	0.29
Direct Production Cost				
Labor	18,000	9.00	0.07	0.26
Fuel	22,000	11.00	0.09	0.31
Reparis	35,000	17.50	0.14	0.50
insurance	24,000	12.00	0.10	0.34
Property Taxes	6,000	3.00	0.02	0.09
Depreciation Expense	40,000	20.00	0.16	0.57
Custom Hire Expense	10,000	5.00	0.04	0.14
Equipment Rental Expense	8,000	4.00	0.03	0.11
Total Production Cost	163,000	81.50	0.65	2.32
Total Production Cost Net of Revenue	143,000	71.50	0.57	2.03

This analysis demonstrates to the farm manager that by making the management decision to rent equipment to the neighbors, total equipment costs are reduced by \$10.00 per acre. By relating this cost savings to units of production, it also demonstrates how much the total unit cost of production has been affected. If this farm produces 125,000 bushels of corn and 35,000 bushels of soybeans, unit cost of production is lowered for each commodity as follows:

	Total Savings	Production	Savings Per Bushel
Commodity			
Corn	10,000	125,000	0.08
Soybeans	10,000	35,000	0.29

Case B – Farmer sells surplus machinery repair parts previously expensed for \$3,500.

Managerial Accounting Question: Is this income revenue to a profit center or cost recovery?

Suggested Treatment. This sale is not really profit center revenue. It should be handled as a cost recovery, or negative expense for the Equipment Repair Expense Account. In essence, prior equipment repair costs showed this expense when the parts were originally purchased, and now management is reversing this action on the amount of parts refunded or sold outright.

Case C – Discounts and Pre-Payment Credits

Farmer receives \$7,000 year-end quantity discount for annual fertilizer and chemical purchases. He also received a pre-payment discount of \$3,000 that was added to the account balance for depositing \$100,000 on January 1 with the feed and seed company; the purchases will not be made until after April 1.

Managerial Accounting Question: Are these transactions primary income for the crop profit center, or should these receipts be shown as a cost recovery?

Suggested Treatment:

1. **Quantity Discount** – The quantity discounts or rebates are a partial recovery or adjustment to the total cost of purchased fertilizer and chemicals and should be shown as a cost recovery. By assigning this revenue to a profit center, it inflates the true value realized from the commodity raised or produced. The fertilizer rebate or discount is strictly an expense related transaction.

2. If the manager recorded this revenue in an income account such as Refunds, the amount could be assigned to show in the managerial report as a Revenue item in the Production Cost Center Report offsetting total production costs. If the amounts are separately identifiable between fertilizer and chemical, the amounts could also be recorded as contra entries (negative expenses) to the chemical and fertilizer accounts allocated proportionately to each crop production cost center.
3. *Pre-payment Discount (and Late Payment Charges)* – The pre-payment discount is a financing decision. If operating loan rates are 6%, the farmer will incur \$1,500 of interest on \$100,000 from January 1 through April 1. The \$3,000 discount should be recorded as income in the Other Income (Expense) Cost Center. If the case involved assessment of charges for late payment, these charges should likewise be shown as Finance Costs, not added to feed and seed costs.

Case D – Cattle and grain operation receives state and federal fuel tax refunds of \$4,500.

Managerial Accounting Question: Should revenue be allocated to the profit centers, or should these receipts be shown as a cost recovery?

Suggested Treatment: As in **Farm Case C**, these refunds are a partial recovery of costs and would not be considered income directly attributable to the commodity produced. Traditional 1040 F tax reporting forms include a line item in the Farm Income segment for *state and federal tax refunds*. This is a prime example where Tax Accounting and Managerial Accounting can differ in reporting format. These refund amounts should be shown as a reduction or credit to fuel expense or entered as a revenue item in a production or equipment cost center, effectively reducing overall production or support center costs.

Case E – Incidental Sale of Excess Wheat Seed

Farmer F sells 300 bushels of treated winter wheat seed raised on the farm in 20X1 to a neighbor at \$8.00 per bushel generating \$2,400 revenue. This seed was left over from seed processed for Farmer F's 20X2 production year. The market price for the untreated wheat is \$3.50 per bushel.

Managerial Accounting Questions: How does management record this transaction for analysis purposes? Is the seed premium that exceeds the \$3.50 market value profit center revenue or should the premium be used to adjust production costs?

Suggested Treatment: If management's intent was to grow grain, and he chose to treat the wheat seed, and if this 300-bushel seed sale were an incidental sale and not a full-scale commercial seed business, the transaction would be recorded as follows:

- The first half of this transaction relates to recording the value of the wheat that was raised and sold as part of the 20X1 wheat profit center or enterprise. If the cost accounting system can generate an accurate cost of production for the wheat used for seed, that cost should be used as the "transfer price" used to place a value on the cost of seed. A common practice is to record 300 bushels at \$3.50 market price as primary revenue to the wheat profit center for the 20X1 production year and use that same value as part of the cost of seed.
- The second entry is to record the premium value for seed processing and chemical treatment. The \$4.50 per bushel total seed premium (\$8.00 seed price less \$3.50 commodity market price) could be shown as a partial recovery of seed costs and processing.

If the farm increased the scale of its seed business to a level where the processing and selling of commercial seed is a significant management segment of the business, the transaction could be handled as follows:

- Set up separate Seed Business as a profit center and
- Allocate direct and indirect costs of procuring and processing seed cost centers.

Case F – Income for Trucking

Farmer G hauls 10 loads of wheat for a neighbor at \$.12 per bushel and earns \$2,400. Farmer G also receives \$3,000 for hauling the landlord's share of crop to the marketing outlet.

Managerial Accounting Questions: Should the hauling revenue be assigned to the wheat profit center or be treated as a recovery of operating costs of the business?

Suggested Treatment for Hauling Neighbor's Wheat: Wheat hauling creates incidental income; the trucking activity is not a primary revenue generating profit center. The revenue generated should be shown as income that reduces total production costs in the Equipment Support operation. The Equipment Support Cost Center will include all the fuel, labor, repairs, and related costs that go along with running the truck. If any "real profit" is in custom trucking, it will tend to lower the equipment support costs per acre over a competitor not engaging in the same exercise.

Suggested Treatment for Hauling Landlord's Wheat: This income could be treated as revenue in the Equipment Support Center or the manager may also choose to record the hauling in a Landlord Reimbursement account. The latter treatment would permit the operator to assign the landlord reimbursement as either a cost reduction to general equipment expense or land rent. Tracking the landlord reimbursement as a separate line item enables the producer to see how landlord cost sharing impacts total rental costs and provides valuable information for negotiating alternative lease arrangements.

Case G – Farm Receives Several Types of Government Payments

Managerial Accounting Question: Before trying to determine how to handle these payments, it helps to look at the basic structure of a Profit Center Analysis and examine how the inclusion of government payments in various report sections changes the usefulness of the managerial report. From the diagram below we will answer the following questions: 1) Are these payments commodity profit center revenue? 2) Are they adjustments to production costs? 3) Are they other income to the farm that should be allocated outside the commodity production cost calculation?

Table 13. Cash Grain Profit Center

Cash Grain Profit Center		
Revenue	3,000	
Total Revenue	<u>3,000</u>	
Production Costs – Direct	1,300	
Production Costs – Indirect	1,200	
Total Production Costs	<u>2,500</u>	
Production Margin	<u>500</u>	
Sales, General & Admin Cost	200	
Finance Costs	100	
Total S,G&A & Finance	<u>300</u>	
Operating Margin	<u>200</u>	
Non-Operating Income (Expense)	50	
Net Income	<u><u>150</u></u>	

Annual AMTA/PFC Payment² (*Agricultural Market Transition Act or Program Flexibility Contract Payment*) – This payment is not tied to a specific crop or production amount. It derives from a nationally set rate tied to the farm's base for specific program crops. The payment is received by the farm regardless of which crop is planted, as long as certain planting requirements are met. (i.e., no ineligible flex crops are planted on base acres).

Suggested Treatment: Income from AMTA has no direct bearing to units of commodity produced. Therefore, it would be inappropriate to include the payment in commodity revenue. It could be included as revenue to the production cost center, effectively reducing per unit production costs. However, the option would mask the true

² AMTA and PFC are current acronyms associated with U. S. Farm Bill authorities and regulations relating to income and price support programs. These acronyms are likely to change during future revisions of Farm Bill authorizations.

cost of production for the particular commodity, so it is not recommended. A third alternative would be to include this payment in non-operating income in the appropriate profit center. This option allows the analyst to see what the revenue, production costs, and overall margins would be before the influence of any government payment. Including the government payment at the conclusion of the report in "Other Income (Loss)" provides an opportunity to convert the dollars received to a per acre and per unit of production value. This conversion allows the farm manager to see to what extent the commodity is profitable with and without the supplemental program payments.

- **FSA Special Relief Payment – Market Loss Payment:** This payment has been traditionally earned on the same payment basis as AMTA payments. The payments do not tie to any specific crop or level of production.

Suggested Treatment: This income is treated the same as the AMTA payment.

- **Loan Deficiency Payments (LDP's):** LDP are made to farmers who, although eligible for Commodity Credit Corporation loans, do not place their grain in the loan program. The LDP is directly tied to the bushels of grain or bales of cotton raised in a given production year.

Suggested Treatment: This income has tied directly to the primary commodity revenue reported in the profit center. Including this income along with proceeds from the market sale of the primary product is essential in arriving at the total income generated per unit of production. Including the value of LDP payments in profit center income provides a more meaningful number to compare against unit cost of production to analyze commodity profitability.

One of the primary reasons for doing managerial accounting is to reflect on performance of specific management sectors or accountability areas. LDP revenue reflects directly on the performance of the marketing strategy for the farm and should be included in revenue directly to the profit center or indirectly as revenue to the Marketing Cost Center.

- **Conservation project cost-share payments:** Payments are received to reimburse a portion of the operator's/landlord's costs for various conservation projects such as developing grassed waterways, sediment ponds, terraces, stream-side fences to keep livestock out of riparian areas, specific tillage practices, or carbon sequestration practices, depending on the specific program..

Suggested Treatment: This income is normally treated as a partial cost reimbursement of expenses incurred to establish the conservation practices. Consequently, it would not be considered income per se but rather a recovery of direct and indirect production costs (i.e., labor, fuel, machinery cost, tiling, grading, backhoe hire, etc.). This revenue should be shown as an expense adjustment for total production costs.

If the nature of the conservation project involves a major capital improvement (such as a fencing project or water system development), the total outlays for the project may warrant capitalizing it as a depreciable asset. In this case, the government payment would serve to reduce the amount capitalized.

Case H – Farm receives \$10,000 reimbursement from the landlord to cover the landlord's share of fertilizer and chemical cost.

Managerial Accounting Questions: Is this reimbursement normal farm income or partial recovery of production costs?

Suggested Treatment: If the farmer and the landlord share equally in the crop share and the share of the fertilizer cost, showing the reimbursement as a cost recovery of fertilizer and chemical costs makes sense. The net bushels the farm has to sell will be compared against the net costs it took to produce bushels available for marketing.

Case I – Sale of Excess Hay

Julie Livestock–Producer raises most of the hay fed to the cattle operation and runs cattle on owned and leased pasture. In a good year, excess hay is sold to neighbors generating \$10,000 in revenue; excess pasture is rented out at \$14.00 per Animal Unit Month.

Managerial Accounting Questions: Are hay sales and pasture rental appropriately classified as revenue in the cattle profit center or should they be shown as revenue or an expense offset in the appropriate cost center?

Suggested Treatment: Management's intent is to raise livestock. The cost of raising hay is considered a normal part of the cost of producing calves for sale. The value of hay sold would be shown as revenue in the appropriate cost center and would serve to lower the cost of production. The pasture rental is an incidental income source that tends to adjust the total cost of cattle production. Consequently, the pasture rental income would be shown as revenue in the production cost center or as a separate contra-expense account. Netting it against pasture rental expense disguises the fact that this reduction in cost is not necessarily recurring – it is available only when weather provides for surplus pasture rental. Because it is included in the cost center, it will ultimately show up as a reduction to cost even though it is recorded as revenue.

Case J – Cattle Ranch or Dairy Receives \$40,000 from Sale of Cull Cows

Managerial Accounting Question: Is this income added to primary revenue in arriving at total profit center income, or is this income a recovery of production costs?

Suggested Treatment: Cull breeding stock revenue is a normal source of revenue for cow-calf, dairy and swine breeding enterprises. The cost of replacing breeding stock is a normal cost of doing business in these industries. Since the costs of raising or purchasing replacements are reflected in the total cost structure, showing the funds generated from cull cow sales as a partial recovery of the heifer replacement total costs is logical.

Case K – Farm Receives Payment from the Insurance Company for Crop Damage

Managerial Accounting Question: Is this payment crop revenue or a recovery of a production cost?

Suggested Treatment: Recording crop insurance revenue can complicate analysis of a profit center, no matter where it is put. Two alternatives are offered for handling insurance proceeds.

1. Revenue in the profit center – If the insurance payment is included in primary revenue along with the value of the crop produced, it gives the analyst a meaningful indication of the total revenue per acre for that crop. However, it gives an inflated value for revenue per unit of production. Some suggest the practice of imputing the number of bushels or units of production that are replaced by the insurance proceeds to gross up the total number of units that the dollar amount of insurance represents. This practice provides a more meaningful analysis of cost per unit of production even though some of the production was produced by the insurance company.
2. Revenue in the appropriate cost center – One of the primary purposes of the profit center report is to arrive at the cost of production to provide a baseline for comparing costs to market pricing alternatives, as well as peer comparisons. With these purposes in mind, including crop insurance proceeds as revenue in the production cost center might be more appropriate. Crop insurance is normally considered a direct production cost, which, usually varies in direct proportion to acres raised. A producer buys insurance to minimize or transfer risk. Insurance income is generally expected to provide a partial recovery of insurance premium outlays. Consequently, over time, crop insurance expense should exceed crop insurance receipts.

By including crop insurance proceeds as a recovery of costs in the production cost center, the analyst will actually be able to determine the net cost the farm incurs for risk management. By leaving the crop insurance revenue out of the profit center revenue section, the analyst can assess real revenue and number of units produced for each crop sector. If the managerial accounting practice is to include the crop insurance receipts as revenue to the cost center, not netting out the crop insurance receipts against crop insurance expense is a better alternative. Netting would hide the per acre costs of purchasing insurance and would mask the impact of crop claims on production costs.

Case L – Farm receives income from commodity by-products

Ashley Straw has wheat, barley, cotton, and dairy. He sells wheat and barley straw, cottonseed, and composted manure as by-products of his grain, cotton, and dairy enterprises.

Managerial Accounting Question: Is the income from the by-products added to primary revenue in arriving at total profit center income, or is it a recovery of production costs?

Alternative Treatments: This income could be treated either as an additional revenue line item in the revenue section of the profit center report or as a recovery of costs and shown as revenue to a production cost center. Including the by-product revenue in the profit center total revenue gives a clearer picture of total revenue generated per unit of production.

If significant amount of production expense is associated with achieving the by-product revenue, to include the revenue as a cost-adjusting revenue line item in the production cost center would be more appropriate. For example, a farm bales and sells straw. A strict accounting for all the labor, equipment, transportation and “bad will” generated by employees whining from handling itchy product may show that the revenue barely covered the added costs required to generate the by-product sales. Including the by-product revenue as a reduction in cost results in lowering production costs to an amount that can be more directly tied to the primary commodity raised.

Chart of Accounts/Definitions

One of the important components of creating a managerial accounting system is to review and finalize the chart of accounts that management will utilize as transactions are posted and stored in the system. In the days of Charles Dickens, Mr. Scrooge, and his hard working accountant, Bob Cratchit, transactions were posted on a bound ledger with the accounts arrayed in columns across the top of the page (a “chart” of accounts). In today’s world of relational databases, accounting systems have functions associated with a “chart of accounts” that go far beyond the historical use.

FFSC created a summary level chart of accounts that would provide guidance to users with a recommended *minimum level* of detail in their accounting system. The NPPC standards have developed a comprehensive recommended chart of accounts that carries five levels of detail for pork producers, and other commodity groups have similar efforts underway. FFSC does not intend to provide that level of detail because to incorporate all types of agricultural operations in a single chart is an activity that is almost impossible in scope and not particularly useful when complete. What FFSC has tried to do, however, is provide some general guidelines about the categorization that is appropriate to maintain within the chart of accounts as a general guide for readers interested in creating or revising their chart of accounts.

Readers need to keep in mind several points as they review the summary level chart.

Various proprietary accounting systems provide different features and capabilities within their chart of account structure. Some systems, for example, allow creation of a single account (chemicals, for example) and then allow association of that account with multiple segments, crop years, and other identifiers as the user enters a particular transaction. Other systems require the creation of an account for each segment/year combination. Which option is available depends on the software.

Certain systems attach particular reporting and data capture functionality to certain types of accounts. For example, a system may have standardized inventory reports that are created for the system and only report on accounts created as “Finished Goods” inventory accounts. If the farmer has breeding livestock and likes the inventory reporting feature, he may choose to set up breeding livestock as an inventory account in his managerial accounting system and then modify the balance sheet reporting structure to report those particular inventory accounts as non-current assets.

Finally, accounting systems can handle the classification and reporting of WIP accounts differently. If these systems are trying to provide income tax reporting as well as managerial accounting functionality, items that are expenses for tax purposes are also WIP costs (assets) as the crop is being produced. Therefore, some systems will have the user set up crop chemicals as an expense account and also indicate that it is used for WIP; others will have the user set it up as a WIP (asset) account and handle the tax reporting issue separately.

These examples show how systems may differ. The important point is that the user can accomplish managerial accounting objectives with a wide variety of software packages. He must understand the functionality and design differences and choose the features that are most consistent with his objectives and internal accounting capabilities.

Regardless of the specific software package design, a number of key associations with each specific account need to be set up in the accounting system. These include:

- How the account balance flows to various reports and how it may be summed on those reports;
- Whether the account can capture quantity information used in segment reporting;
- How the account is associated with various segments such as profit centers, cost centers, investment centers, and
- How the account is associated with production cycles such as crop year and livestock production cycles.

The user must understand how the system he selected handles these types of associations prior to finalizing the chart of accounts.

The FFSC Summary Chart of Accounts is organized by Account Type, which refers generally to the location of the account in the balance sheet or income statement. Specifically, the Account Types utilized are income statement and balance sheet accounts.

Income Statement Accounts

Revenue	These accounts represent revenues from the profit centers within the accounting system. They are the revenues from the profit-focused activities of the business.
Production Expenses (COGS)	These accounts represent the production costs related to the revenue accounts. Usually a one to one correspondence exists between revenue accounts and production expense accounts.
Operating Expenses	These accounts represent the expenses associated with producing revenues that are not production related. They are identified in four major categories – Sales Expenses (expenses that are related to a specific sale transaction), Marketing Expenses (expenses that are not related to a specific sale transaction), Freight Expenses (related to the transportation of finished goods), and General and Administrative Expenses.
Other Revenue (Expense)	These accounts represent revenues and expenses not related to operating activity but are those items related to financing or investing activities. Major components of this account type include financing expenses and gains (losses) on disposition of non-operating capital assets.
Income Tax Expense	These accounts represent the actual and deferred income tax expense.

Balance Sheet Accounts

Current Assets (other than inventory)	These accounts represent cash or items that will be converted to cash or used up in the normal operating cycle of the business. Inventory accounts are also current asset accounts but are separately identified because of their importance.	
Inventory	Three types of inventory accounts in the summary chart are:	
	Raw Materials	These accounts represent materials to be used in the production process that have been purchased but not yet utilized. Most common are crop inputs, feed, and fuel.
	Work in Process (WIP)	<p>The chart includes three types of WIP accounts:</p> <p>WIP Transfer. These accounts are utilized in livestock systems where the user wants to maintain the cost of an animal at the end of each stage rather than accumulate the entire cost in the production stage cost center. For example, in a cow/calf production system, the allocated cost of weaned calves would be transferred to a WIP Transfer – Calves account when those calves were transferred to backgrounding. The costs of backgrounding would be accumulated in the Backgrounding Cost Center. When the calves are transferred to the Stocker phase, the totals of the Backgrounding Cost Center would be transferred to the WIP Transfer – Backgrounding account and the incremental costs of the stocker phase of production would be accumulated in the Stocker Cost Center.</p> <p>WIP Revenue. These accounts include production-related revenue that is ancillary to the core business and whose primary purpose is to reduce overall production costs rather than create profit.</p> <p>WIP Costs. These accounts are the accumulators for all production-related costs in the system.</p>
	Finished Goods	These accounts represent products where the production process is complete and the items are available for sale. Generally, these accounts are used only for crop-related accounts.
Non-Current Assets	These accounts represent all assets that do not meet the definition of current assets. The included valuation account is utilized to capture the difference between book value and market value of capital assets.	
Current Liabilities	These accounts represent those amounts whose liquidation will require the use of existing current assets or the creation of additional current liabilities.	
Non-Current Liabilities	These accounts represent those amounts that do not meet the definition of a current liability.	
Owner Equity	These accounts include the four major components of owner equity – contributed capital, retained earnings, current year net income (loss), and valuation equity (net). Some software systems may include current year net income items in retained earnings.	

Example Chart of Accounts

Current Assets

Cash
Accounts receivable – trade
Accounts receivable – other
Notes receivable
Prepaid expense
Deposits
Marketable securities
Deferred tax asset
Other current assets

Inventory – Raw Materials

Crop inputs
Livestock inputs
Supplies

Inventory – Work in Process (Revenue)

Crop insurance proceeds
Custom services
Gain/Loss on asset disposition
Government receipts
Hedge gain/loss
Other revenue
Patronage dividends

Inventory – Work in Process (Costs)

Amortization cost
Animal health cost
Breeding cost
Chemicals cost
Contract production cost
Custom hire cost
Death loss cost
Depreciation cost
Feed cost
Fertilizer/Lime cost
Fuel, oil & gasoline cost
Insurance cost
Irrigation water cost
Labor – benefits cost
Labor – contract cost
Labor – wages cost
Other cost
Production enhancers cost
Professional services cost
Rent/Lease cost
Repairs cost
Seeds/Plants cost
Supplies cost
Taxes cost
Utilities cost

Inventory – Finished Goods

Crops
Livestock

Non-current Assets

Breeding livestock
Buildings & improvements
Land
Machinery & equipment
Accumulated depreciation
Securities & investments
Notes receivable
Other non-current assets

Current Liabilities

Accounts payable
Accrued Interest
Accrued Income taxes
CCC loans
Current portion of deferred taxes
Current portion of non-current notes payable
Notes payable
Other accrued expenses
Other current liabilities

Non-current Liabilities

Capital lease obligations
Deferred taxes
Mortgages payable
Notes payable
Other non-current liabilities

Owner Equity

Contributed capital
Retained capital
Valuation equity
Current year income/loss

Revenue

Contract production fees
Crop insurance proceeds
Crop sales
Custom services fees
Government receipts
Hedge gain/loss
Livestock sales
Livestock product sales
Other revenue
Rental income

Production Expenses

(Cost of Goods Sold)

Crop cost of goods sold
Livestock cost of goods sold
Livestock products cost of goods sold
Contract production cost of service
Custom services cost of service
Other cost of goods sold

Operating Expenses

Amortization expense
Custom hire expense
Depreciation expense
Fuel, oil & gasoline expense
Insurance expense
Labor – benefits expense
Labor – contract expense
Labor – wages expense
Marketing expense
Other operating expense
Professional services expense
Rent/Lease expense
Repairs expense
Sales expense
Supplies expense
Taxes expense
Utilities expense

Other Revenue/Expense

Dividend income
Gain/Loss on asset disposition
Interest expense
Interest income
Other expense
Other income
Patronage dividends/refunds

Income Tax Expense

Deferred tax expense
Income tax expense

A Process for Setting up a System

Introduction

The following paragraphs describe issues to consider and a sequence of activities to follow in pursuit of establishing a managerial accounting system in an agricultural production operation. This discussion presumes the decision to implement such a system has been made and therefore does not specifically address the various issues that might be considered in the process that leads to that decision. However, many of the issues that must be addressed during implementation will be considerations in the deliberations leading to the decision to implement such a system. In this sense the process is iterative and, to a significant extent, the more thorough the pre-implementation analysis and deliberations the more extensive will be the foundation upon which the system will be built.

Another dimension that will influence the issues identified in the following paragraphs of this section is the accounting and production software chosen. Regardless of the software selected the many issues noted below must still be addressed though the actions taken in implementation may vary.

Examine Management Styles and Processes

It is important to consider and understand how the operation is presently managed, how decision authority and responsibility are distributed through the organization, and how effective and satisfactory current management processes are. The key issue at this point is whether to implement a system that embraces existing management approaches and processes or to take advantage of this time of change and implement a system that, by its design, results in substantial changes (and presumably) improvements in management processes and effectiveness.

One method is to essentially systematize in this implementation existing management practices, responsibility segmentation, reporting practices, and decision approaches. Another method is to reflect on how the organization may want to manage itself in the future. This latter method focuses on implementing a system that envisions formalization and changes in responsibility segmentation, knowledge accumulation, related reporting practices, and enhanced decision approaches made possible through such changes in management strategy.

Many organizations' existing approach to accumulating financial type information is limited to that which is necessary to meet essential compliance needs. This approach is typically focused on being able to meet the annual tax filing and loan renewal requirements. While this is a common emphasis regarding financial information, many operations have quite extensive (though often informal) information systems in place to deal with production activity. If these characteristics are present, the managerial accounting system implementation process is an opportunity to move the financial side of things well beyond the compliance focus and to more effectively integrate this side of the business with the production information. This can provide operating staff with more appropriate knowledge with which to make their operating decisions.

One caveat in the integration of financial and production information stems from the increasingly common practice of gathering production information at extensive levels of detail. When this is the practice, management will have essentially spoken regarding their sense of value in detail information. It may well be in these implementation environments that management's instinct will be to take the financial information to a comparable level of detail. For example, production information at the sub-field level is common today. Management may naturally lean to taking financial information to the same level. If we know the application rate of crop inputs to the grid coordinates why not take the costs to the same level of detail?

While this is theoretically feasible, it is most likely impractical. Moving from a single production cost center for each crop commodity to a cost center for each field will likely result in a huge increase in the number of cost centers. To further increase the cost centers to accommodate each data grid in each field could result in an increase in the number of cost centers by a few orders of magnitude. Barring a sophisticated, comprehensive interface between production management software (where individual zone application rates are captured) and the accounting software, the transactional coding burden of this approach is not likely to be practical.

Even if a means is found to allow the practical handling of the transactional burden it is important to consider the relevance of having financial information at such a detail level. Clearly, production can be managed at such a detail level. However, such decisions as renting a field, the profitability of a crop, or even of a crop grown on a particular field are not made at the sub-field level. At best they are made at the field level and even then that may not be the relevant decision perspective. So while the integration of financial and production information is an important benefit of using a managerial accounting system the extent to which this is specified must be carefully considered in the implementation plan.

The assessment of management styles and processes, existing and envisioned, is critical to the ultimate system implemented. It encompasses such considerations as organization competencies, commitment to creating a culture of information accumulation (if not already present), and investment in information systems, management processes, and staff training.

It is important to keep in mind that there is no particular right or wrong system design for an organization. There will inevitably be a series of tradeoffs between information that is primarily available and that which may need to be assembled in an ad hoc process on an intermittent frequency. There will be deliberations between the cost and risk of complexity in system design vs. the limited use of information that is inappropriately general and lacking in specificity and applicability to management decisions. When considering the pros and cons of these tradeoffs, it may well be wise to choose simplicity unless there is a clear case for the value of complexity. A well-implemented, though somewhat simplified, system in which operating staff participates will naturally grow to the necessary level of complexity and information suitability as those affected grow and ask for more knowledge with which they can perform at a more effective level.

Identify the Managerial Accounting Structure

A thorough examination of the many aspects of management style and processes as identified in the previous section will lay the foundation for identifying the managerial accounting structure. The fundamental focus in this section of the implementation process is to determine the most appropriate segmentation of the business. This segmentation results in the focus of management attention on specific parts of the company's operation and is a core concept of managerial accounting as discussed earlier in this publication.

To focus on the managerial accounting structure, consider the various products, related production processes or phases, production locations, and activities or significant functions in the business. Any and all of these are potential management segments or cost objects on which management may want to gather information and focus its attention.

As noted in the Concept of Responsibility Centers section of this publication, these management segments are generally referred to as cost and profit centers. Refer to that section as a refresher on this aspect of specifying the managerial accounting structure for the operation.

It is important to understand management's intent as regards these various segments in order to determine the type of responsibility centers they will be and thus how they will fit into the system. This determination of management's intent as regards various segments of the business considers a number of elements.

One of these elements is the role management sees the particular segment playing in the overall conduct of business or the goals management has for that part of the business. For example, does management see the particular segment as one whose principal role is to produce revenue from the production efforts of the business? Does management principally expect the segment to provide support activities to other portions of the business even though ancillary revenue (e.g. custom equipment services) may be present?

A further contributor to the determination of management's intent for a particular cost object of the business is the desired behavior of those responsible for that segment. For example, does management wish the segment manager to be principally focused on cost control and minimization? Or does the segment manager have responsibility for managing market risk and maximizing revenue? Does management expect the person responsible for that segment of the business to focus on business development and increasing market share?

Another consideration in specifying the managerial accounting structure to be implemented for the operation is the level of detail management and operation's staff wishes regarding the cost objects of the business. An example is mentioned in the Concept of Responsibility Centers section of this publication of a producer who grows both winter and spring wheat. Some operations will prefer detail production cost centers for each while others will decide to implement a single segment that embraces both crops. Similar examples relate to the level of detail regarding equipment and forage cost centers.

There is a continuous need to balance the cost associated with increased system complexity with the value (and potential impact on management decision making) from having more finely detailed cost object information. In the previously mentioned example of winter and spring wheat, if the mix of these two crops is more driven by work load distribution and production risk consideration than a particular focus on the relative profitability of each, it may make sense to have a single wheat production cost center.

An additional consideration in determining the managerial accounting structure is to clearly understand who in the organization is responsible for a segment. If there is no one responsible for a particular segment, carefully consider the value of accumulating such information and the likely quality of such information if no one has a vested interest in participating in its accumulation from both the production and financial perspective.

Perhaps a final consideration in determining the appropriate cost pools in a managerial accounting system is to assess whether the contemplated segment is sufficiently large in terms of dollars and activity to warrant establishing it as a cost or profit center. There are certainly reasons to create cost centers for otherwise small or immaterial cost pools. Some of these reasons may be to avoid compromising the integrity or clarity of costs included in another pool and also to begin the process of knowledge accumulation in what may actually be a research and development or experimental activity at the current time.

Ultimately, after suitably considering the issues previously mentioned in this section, it is time to lay out the segments, specify their type, and indicate their relationship to each other thus reflecting the sequence by which costs flow through the business. This is also an opportunity to clearly indicate those cost object pools that are production in nature and those that represent non-production period expense related activity.

Define the Allocation Methodology

Reference is made in concluding the previous section to specifying the type of cost object pools to be implemented and indicating their relationship to each other as a reflection of the sequence by which costs flow through the business. This flow of costs through the business is facilitated by defining the allocation methodologies to be employed.

All transactions that can be directly attributable to a profit or cost center are handled accordingly as direct costs/expenses. All allocations are the combination of direct costs/expenses and/or previously allocated (and now in the current cost pool) indirect costs/expenses. As noted in previous sections of this publication and in related examples, all costs and expenses ultimately end up being allocated to a profit center or capitalized on the balance sheet. Moving the costs/expenses to their ultimate destination is accomplished by specifying a criteria or method to use in a systematic manner.

The Allocation Methodologies section of this publication contains an extensive discussion of the allocation process including guidance on specifying appropriate allocation criteria. It is essential that both the nature (make up) of the cost object pool as well as the purpose of the allocation be understood.

One commonly used factor in selecting an allocation criteria or base is to determine the most objective and measurable way a particular cost center provides support to either another cost center or a profit center. Preferably allocation criteria will be objectively measurable units though this is not essential. It may be most appropriate in some systems to use a management specified allocation relationship resulting from management's best estimate. Where an objective measure is used it should be practical and easy to obtain. To a significant extent the selection of allocation criteria must be in tune with the previously referenced commitment of the organization or culture of gathering information in an effective manner. Selecting criteria that are too difficult to obtain in a consistent manner will undermine the allocation process and thus the entire system effort.

Specify Production Units of Measure

As previously noted in this section, one of the significant values of implementing a managerial accounting system in an agricultural production operation is the comprehensive integration of financial and production information. Part of this integration is the accumulation and reporting of cost information on a per unit basis. The per unit information may take many different forms depending on what is important to management when measuring the performance of a particular cost pool.

In some cases, the per unit information may be related to a base production resource (the item which most significantly drives revenue) such as an acre or a breeding female. In other situations, the per unit information may be related to output such as per bushel, per weaned pig, or per calf. It may also be appropriate to have multiple per unit metrics for a particular cost pool. For example, a cow calf cost pool performance might be analyzed from a per cow exposed, per calf produced, and per hundred weight produced perspective.

Each cost and profit center should be considered from the perspective of the most appropriate per unit metrics with which to assess performance. One unit of measure will commonly be the unit in which the production is sold. Another common unit of measure will be the base resource of that particular segment of the business. As with the specification of allocation criteria, it is essential that production units of measure be practically obtainable and subject to consistent and reliable measurement.

Specify the Chart of Accounts

The chart of accounts established in setting up a managerial accounting system is the final specification of the level of financial and integrated production information detail that will be regularly provided to management. The earlier section in this publication regarding the chart of accounts describes the chart of accounts elements in general and lays out a suggested minimal level of detail. Some operations will find this minimalist approach sufficient. Other operations will choose to include significant amounts of detail in their chart of accounts.

For example, some operations will find the comprehensive account "Fuel, Oil & Gasoline Costs" sufficiently detailed. Other operations will create a series of accounts to cover this area of activity such as:

- Diesel highway cost
- Diesel off-road cost
- Gasoline cost
- Oil & lubricants cost
- Hydraulic fluid cost

This is another example of the need to balance the cost of complexity with the manner in which management intends to use the resulting information. If management wishes to manage by monitoring detailed transactional information a chart of accounts with significant detail will be appropriate. However, if management plans to monitor activity at a more general level within a segment and not focus on extensive line item detail a less detailed chart of accounts will be adequate.

One consideration when specifying the chart of accounts detail is to carefully consider the previous described issues of management style and how that may change as a managerial accounting system based management platform is instituted. One of the frequent and empowering results of a managerial accounting system is to drive cost awareness further into an organization. With the establishment of cost pool focused information more members of the operating staff will typically be made aware of costs within those parts of the company in which they participate. Where senior management may have been reluctant to share financial information when it was only available in general terms covering much, if not all, of an organization, they will frequently be more willing to share financial information with operating staff when it only relates to a part of the company.

To the extent that management involvement may be extended into the company a more detailed chart of accounts approach will be desirable. Where a senior manager may only be interested in the previously described general "Fuel, Oil & Gasoline Cost" a manager with specific responsibility for a segment may be interested in the greater detail described. The segment manager will typically seek and manage with a more detailed focus. Thus one of the primary considerations when establishing the chart of accounts is to meet the informational needs of all levels of management.

A secondary chart of accounts design objective is to facilitate meeting organization compliance needs. Perhaps the classic example of this issue is the creation of a mortgage interest account separate from term and operating loan interest expense accounts. This facilitates providing frequently needed information for tax reporting.

Prior to establishing a managerial accounting system, management frequently obtained segment type information by creating multiple accounts to cover a single natural account. For example it is common to see a non-managerial accounting system chart of accounts with several Seed Cost accounts (Seed Cost – Corn, Seed Cost – Soybeans, Seed Cost – Wheat, Seed Cost – Navy Beans, etc.). In a well designed managerial accounting system it will generally be necessary to have only a single Seed Cost account. The combination of a crop production cost center and a single natural cost account will fully meet all the informational needs that previously required many accounts. For example, a transaction coded to Seed Cost and charged directly to the Corn Production and Soybean Production Cost Centers for those respective seed uses will accomplish what previously required several accounts. Consequently a managerial accounting system chart of accounts will typically contain many fewer accounts than that to which many operations are accustomed.

A final consideration in specifying a chart of accounts deals with the quantity attribute typically associated with an account in software designed to facilitate the application of managerial accounting in an agricultural production operation. This quantity attribute permits the capture of units purchased along with the cost of those units. For example the “Diesel Offroad Cost” account can contain both the dollars and the gallons involved with each transaction. However, the quantity attribute is less meaningful in the more general “Fuel, Oil & Gasoline Cost” account. The mixing of quantities of several different items is not useful and a waste of administrative resources.

Therefore it is necessary to consider what quantity information can and perhaps should be provided through the transactional processing system. Matching the quantities purchased with the dollars expended is most easily accomplished in the transaction system because of the inherent controls present in a double entry system with periodic account reconciliations, etc. If management is going to regularly want to know the quantity, and thus the cost per unit, of regularly purchased items to have a resource that may facilitate purchase negotiations and usage monitoring it will be appropriate to create suitable detail accounts. Again the trade off of system complexity and value of the information must be balanced. Will the information be needed sufficiently often that it warrants capturing it at the transaction level or will it be needed infrequently enough that, when needed, it can be extracted from the invoice files via an ad hoc analysis? An ancillary aspect of assessing this trade off is to recognize that information readily available is generally more likely to be put to use, and thus presumably of greater value, than if it is buried in some file cabinet or file box and only available through an ad hoc process.

The software that is generally in use today for this type of application will typically have a set of default accounts driven by basic production aspects of the business. This will make the initial chart of account selection an easy process. However, there remain a number of considerations to be addressed in fine tuning the chart of accounts to be implemented in the system.

Understand Report Content

The Management Accounting Levels of Reporting section of this publication contains extensive discussion/examples of reporting issues. Refer to that section as necessary to refresh basic details and core concepts. The managerial accounting reports must match the organization’s management structure. This should naturally follow presuming the implemented system was designed with appropriate consideration of the issues identified in the previous steps in this section.

The software that is generally used today for this type of application will typically provide reporting for individual cost pools as well as most any combination of cost pools. Consequently it should be straightforward to prepare reports oriented to measure the performance of various segments of the business as well as of those responsible for managing those segments.

It is important to keep in mind the distinction between direct and indirect costs/expenses as presented in manageable segment reports. While the report may present a full combination of both types of costs/expenses, the segment manager is typically only responsible for direct items in his/her cost center as the indirect items are incurred in and potentially managed by another manager of the source cost pool. In many operations individuals may be responsible for several cost pools. However, even though a single individual may be

responsible for all the costs presented on a report the direct costs are managed within the segment where they are incurred. The managerial accounting reporting must accommodate this.

The reports must be geared to the level of detail required by the manager for whom they are prepared. This is an issue similar to that observed in the chart of accounts specification discussion. More senior management will frequently want more summary reporting while particular cost pool managers will want much greater detail with which to assess the performance of their areas of the company and of themselves.

While this issue will typically be addressed within the reporting capabilities of the chosen software, the usefulness of the reports will be improved to the extent that reports have a consistent presentation of the various revenue, cost, and expense components. The available reports will typically accommodate various time slices of activity and account balances at various points in time such as fiscal periods, calendar periods, and production cycles. Users must understand the different informational elements of each and learn which reporting parameters are relevant for their purposes.

Finally, to have the best value the reports must be available to the users in a timely manner on the expected frequency. This frequency may be as often as daily, weekly, or monthly and as infrequently as annually.

The various reporting of information that flows from a managerial accounting system is the culmination of, or the output from, the implemented processes. While there is typically significant value in reorienting managements focus and driving relevant knowledge deeper into an organization, it is at the point of reporting that the various users will see much of the value of the system.

It may not be possible for many users to fully understand the implications of the many issues discussed in the previous steps of this implementation discussion until they see the resulting reports. Consequently the issue of understanding the report content is a critical phase of the system implementation process and reinforces the iterative nature of the system specification and implementation. It will likely be necessary to work multiple times through the steps and related issues discussed in this section. As prospective users see reported results from choices previously made they can make appropriate revisions in the implementation specifications.

However, the magnitude of the management changes that may result from implementing a managerial accounting system will likely be so extensive that, regardless of how carefully the various issues are considered, the management team will ultimately identify further opportunities to improve the system to meet their needs. In this sense the system implementation process will be an ongoing exercise as management realizes value from the system, improves their results and sees further opportunity for additional improvements.

Glossary and Definitions

Capitalized Inventoriable Costs – Those capitalized costs associated with the purchase of goods for resale or costs associated with the acquisition and conversion of material and all other manufacturing inputs into goods for sale.

Capitalized Noninventoriable Costs – Those capitalized costs associated with any aspect of business other than inventory.

Common Costs – Costs of activities shared by two or more cost objectives.

Contribution Margin – The difference between revenues and total variable costs.

Controllable Costs – Costs over which managers have control because they have the authority to make decisions that affect the costs.

Conversion Costs – Manufacturing overhead and direct labor together.

Cost – The amount of resource given up in exchange for some good or service.

Cost Accounting System – The system within an organization that provides for the collection and assignment of costs to intermediate and final cost objects.

Cost Allocation – The distribution of indirect production costs to individual cost objects.

Cost Assignment – The distribution of cost items to cost objects.

Cost Object – A function, organizational subdivision, or product whose costs are measured.

Cost Responsibility Center – An identifiable organization subdivision headed by a manager held accountable for the accomplishment of specific functions and for control of the costs of those functions.

Direct Costs – Costs that can be identified specifically with a single cost object in an economically feasible manner.

Discretionary Cost – A cost whose amount within a time period is governed by a management decision to incur the cost. The amount is not related to the volume of production or sales or to the capacity of the organization. Most discretionary costs are fixed, but some may be variable.

Expense – the amount of resource used during a specific accounting period. Product costs are recorded as assets at the time products are made; they become expenses only when the product is sold. Period costs are costs of goods and services that are recorded as expenses in the period in which they are consumed.

Final Cost Object – In a cost accounting system, the product whose cost is measured.

Fixed Cost – A cost that is expected to be at a constant amount in a given time period regardless of changes in volume in that time period.

Full Cost – The sum of the direct costs and applicable indirect costs assigned to a cost object.

Indirect Costs – Costs that are common to two or more cost objects and cannot be identified specifically with any one of these cost objects in an economically feasible manner; also called overhead cost.

Intermediate Cost Object – In a cost accounting system, a focal point for the grouping of costs prior to their assignment of final cost objects: a cost center. Intermediate cost objects may be cost responsibility centers, service cost centers, production cost centers, or production cost pools.

Operating Costs – All costs associated with generating revenues, including (or excluding) cost of goods sold. They include the period expensing of noninventoriable costs and noncapitalized costs.

Operating Income – The difference between revenues and the total of the variable costs, the direct fixed costs, and the indirect fixed costs assigned to a segment of the organization.

Period Costs – Expenses that cannot be associated with specific products. Cost of goods sold is the product expense for the period resulting from the sale of products.

Prime Costs – Direct labor and direct materials.

Product costs – Costs of acquiring or producing products and are recorded as assets.

Production Cost Center – A cost responsibility center whose functions contribute directly to the production of a product.

Production Cost Pool – A grouping of indirect production costs that have a similar causal relationship to the cost objects to which they will be assigned. A production cost pool also may be a cost responsibility center.

Production Costs – Costs incurred in the production process to bring goods to the point at which they are ready for sale or costs incurred to produce services.

Segment Contribution – The difference between revenues and the total of the variable costs and the direct fixed costs assigned to a segment of the organization.

Service Cost Center – A cost responsibility center whose functions are to provide support or service to other cost centers. Examples could be maintenance, general factory, and occupancy.

Variable Cost – A cost that is expected to increase as the volume of production, sales, or some other cost-causing factor in a period increases and that is expected to decrease as the volume in a period decreases.



Management Accounting Guidelines

For

Agricultural Producers

Appendix A

Case Study No. 1

Recommendations of the
Farm Financial Standards Council

January 2008

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CASE DESCRIPTION

Name of farm:	Carl and Clara Cyclone
Commodities produced:	Corn and Soybeans
Unique characteristics of this case:	Carl and Clara have an arrangement to share equipment with their son who operates a similar farming operation independently.

Farm Background

Operational and Production Information

Carl and Clara Cyclone produce corn and soybeans on their 1060 acre crop farm located in the corn belt of the mid-west. 480 acres of corn and 480 acres of soybeans are raised annually in a rotation. Additionally an 80 acre farm owned by Carl and Clara is crop share rented to their son who has been farming for 12 years. For the sake of this case study, only Carl and Clara's farm is being considered during the process of designing a managerial accounting system.

Carl and Clara own 260 acres of the 1060. 800 acres is rented of which a 50/50 crop-share arrangement is used on 480 acres and the remaining 320 acres is cash rented. The 800 acres is rented from a total of 5 different owners.

Carl and Clara's farm is operated independently of their son's farm. However, the unique feature of these farms is that one common line of machinery is owned between the two operations. Carl and Clara own one major tractor, the combine, a major piece of spray application equipment, a smaller tractor, and a few pieces of minor equipment. Their son owns one major tractor, the tillage equipment, and a planter. Each party independently owns their own pieces of equipment. The estimated value of the equipment owned by each of the two entities is proportional to the amount of crop land that each entity operates. Custom fees for machinery operation do not change hands between these operations because of the proportional ownership of the equipment. Carl and Clara's son operates a total of 880 acres which is also rotated between corn and soybeans.

Carl and Clara raise corn and soybeans for the cash market. It has not been their intent to produce either seed crops or other specialty crops in the past, but it could be an option in the future. They have on-farm grain drying and storage facilities in which they routinely condition their crops for market.

Ownership, Management, and Employee Structure

Carl and Clara own and operate their farming business as a sole-proprietor. Production agriculture has been a part of the Cyclone family legacy for generations. Carl is the primary decision-maker for all operating decisions. The major capital decisions usually become joint decisions between both Carl and Clara. Clara has a successful off-farm career, which places high demands on her time. Therefore, Clara is not involved in the day to day operations of the farm business.

This farm has no outside full-time employees. Occasionally a part-time high school student is hired to assist during busy seasons. Carl performs all of the bookkeeping tasks for this farming operation. Clara would say that bookkeeping is Carl's hobby and passion. The use of on-farm computer accounting software has offered new and additional opportunities for gathering information about the farm's performance. Simultaneously, challenges of implementing the accounting system as they are moving toward managerial accounting have occurred.

Management Intent

Carl is nearing retirement age and will likely retire in the next 5-7 years. As stated earlier, production agriculture has been a major part of the Cyclone family legacy for several generations and Carl and Clara would like to see it continue for generations to come. Family values and community service has been an important part of Carl and Clara's focus in the past and will continue to be a focus in the future.

It is unlikely that a change away from a corn and soybean rotation will occur in the near future based on cultural practices. It is Carl's desire to be able to better assess the differences in cost of producing corn and soybeans

on each farm. Analyzing the value of the different lease arrangements between farms is also on Carl's radar screen. Like commodities from all farms get mixed with other like commodities after harvest since they are conditioned for market with on-farm facilities. Keeping the crops separated by farm or field once they are harvested is not important at this point. Carl would also like to know the differences in profitability on an annual basis between each of the two commodities even though major change in the type of crop planted is unlikely.

Carl doubts that he will be making major changes in his production system between now and retirement but still wants to fine tune his operation. As he looks at his son's farming operation from a distance, Carl can see a resemblance of his own management mind set a few years back. That is to say that he sees the younger Cyclone focused more heavily on production management than on financial management and accounting. Carl's hope is to get in place a sound managerial accounting system that will be fine tuned by the time he retires. In so doing, when his son takes over the entire operation, a system will be in place that can easily be modified to help the next generation address the managerial decisions that will be key in the future.

Suggested Solution

Cost and Profit Centers

It is assumed from the discussion with Carl and Clara that their primary interest is in knowing the differences in cost of production between farms and their differences in overall profitability between commodities produced in different years. It can be further assumed that Carl is very interested in setting up a managerial accounting system that will be the basis for gathering information for management purposes for the next generation as well.

With those assumptions, Carl's managerial accounting system will have a support cost center for his equipment, shop and maintenance, and general farm. He will have production cost centers for each land owner and one each for the stages of production. A profit center will be established for each commodity for each year. Additionally a cost center will be established for general, sales and administration as well as for financing.

Schematic of Relationship between Centers

The following schematic details the relationship between each of the cost centers and profit centers. Be sure to note that this schematic is the likely schematic for Carl and Clara Cyclone based on their situation and desires. Other variations of this plan may certainly be possible and workable.

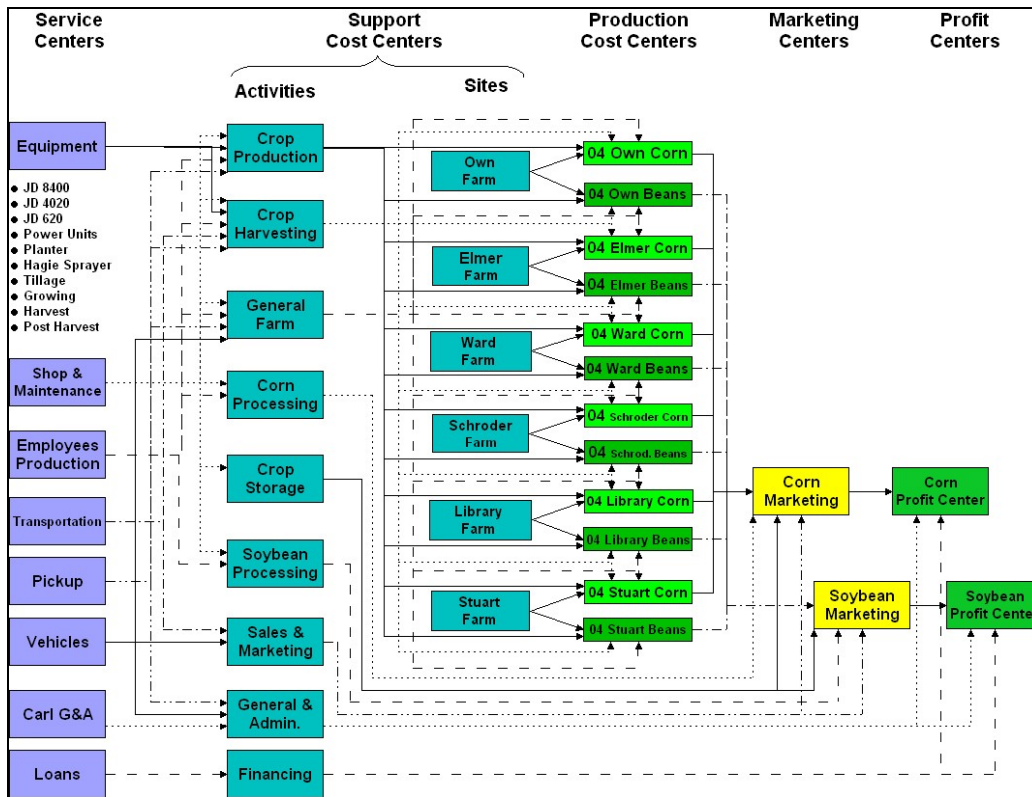


Figure 21. Center Schematic

Service Centers

This optional level of cost center provides a means for tracking costs by individual pieces of equipment, employees as well as shop and maintenance expenses. These centers are annually allocated to support costs centers using percentages. (See left side of Figure 22 and Table 14.)

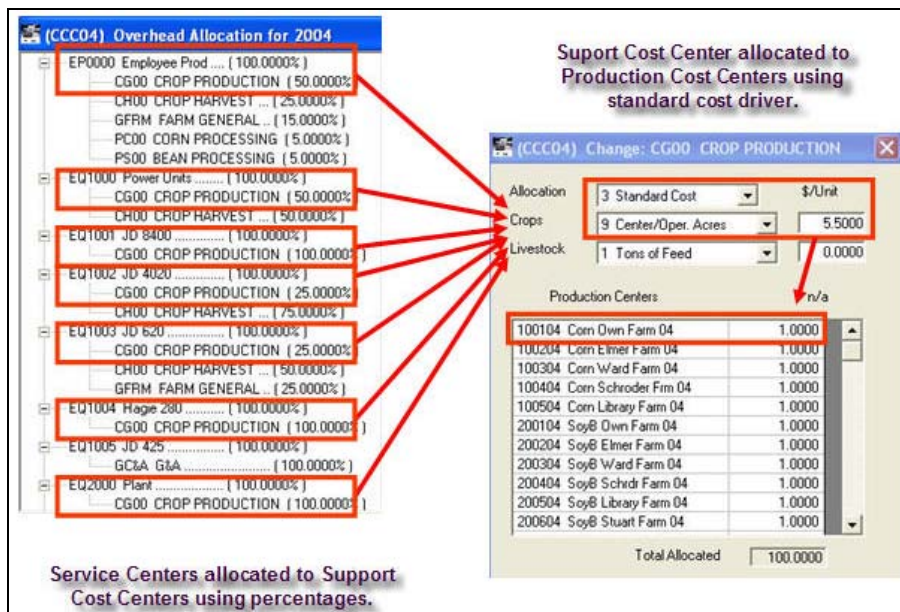


Figure 22. Allocation of service centers (i.e., employees and equipment) on the left to the Crop Production support cost center on the right using percentages. The Crop Production center uses Center/Operation (Trip) Acres as a standard cost driver to allocate production activity costs to production cost centers.

Support Cost Centers

In this case study support cost centers are classified as either *activities* or *sites*. Activities can be as general as “Crop Production,” which in this example includes all pre-harvest field operations, or specific (“Planting,” “Spraying,” etc.). Farmland-related costs and revenues are posted to site cost centers. Both activities and sites use standard cost drivers based on Activity-Based Costing to allocate costs to either production cost centers, marketing centers or profit centers. (See right side of Figure 22 and Table 14.)

Production Cost Centers

These cost centers encompass full field production records and the accompanying work in process costs by commodity, farm and production year.

Under each production cost center is one or more *projects*, which store acreage and landlord split details for each field.

Marketing Centers

When crops in production cost centers are harvested, those finished goods inventories are automatically transferred to Corn or Soybean marketing centers. Under each marketing center are *projects* for each production year.

Profit Centers

The Corn and Soybean profit centers incorporate allocations from the Sales & Marketing, General & Administrative and Financing support cost centers and are combined with marketing centers in the crop profit center reports.

Allocations and Allocation Criteria

The method selected to allocate costs out of either a support cost center or a production cost center is critical. Selection of that method should be based on the unique characteristics of each specific business. The following methods of allocation may be logical for the Carl and Carla Cyclone operation.

Table 14. Service Center Allocation Criteria

Service Centers	Center Allocated	Allocation Methods	
		1st Choice	2nd Choice
Equipment	Crop Production	Hours	Management Discretion
	Crop Harvesting	Hours	Management Discretion
Shop & Maintenance	Crop Production	Hours	Management Discretion
	Crop Harvesting	Hours	Management Discretion
	General Farm	Hours	Management Discretion
	Corn Processing	Hours	Management Discretion
	Soybean Processing	Hours	Management Discretion
	Crop Storage	Hours	Management Discretion
Employees, Production	Crop Production	Hours	Management Discretion
	Crop Harvesting	Hours	Management Discretion
	Corn Processing	Hours	Management Discretion
	Soybean Processing	Hours	Management Discretion
Transportation	Crop Storage	Hours	Management Discretion
	Crop Production	Hours	Management Discretion
Chevy Pickup	Crop Harvesting	Miles	Bushels
	Sales & Marketing	Miles	Bushels
Vehicles	Crop Production	Miles	Hours
	Crop Harvesting	Miles	Hours
	General Farm	Miles	Hours
	G & A	Miles	Hours
Carl G & A	Sales & Marketing	Miles	Hours
	General Farm	Miles	Hours
	G & A	Miles	Hours
Loans	Financing	Assets	Management Discretion

Table 15. Support Center Allocation Criteria

Support Cost Centers		Allocation Methods	
Service Centers	Center Allocated	1st Choice	2nd Choice
Crop Production	Corn-Bean Production	Trip Acres	Hours
Crop Harvesting	Corn-Bean Production	Planted Acres	Harvest Bushels
General Farm	Corn-Bean Production	Center Acres	Trip Acres
Corn Processing	Corn Marketing	Moisture Points	Purchase Bushels
Soybean Processing	Soybean Marketing	Bushels	Trip Acres
Crop Storage	Corn-Bean Marketing	Avg. Inventory	Purchase Bushels
Sites	Center Allocated	1st Choice	2nd Choice
Own Farm	2004 Own Corn	March 31 Acres	Management Discretion
	2004 Own Soybeans	March 31 Acres	Management Discretion
Elmer Farm	2004 Elmer Corn	March 31 Acres	Management Discretion
	2004 Elmer Soybeans	March 31 Acres	Management Discretion
Ward Farm	2004 Ward Corn	March 31 Acres	Management Discretion
	2004 Ward Soybeans	March 31 Acres	Management Discretion
Schroder Farm	2004 Schroder Corn	March 31 Acres	Management Discretion
	2004 Schroder Beans	March 31 Acres	Management Discretion
Library Farm	2004 Library Corn	March 31 Acres	Management Discretion
	2004 Library Soybeans	March 31 Acres	Management Discretion
Stuart Farm	2004 Stuart Corn	March 31 Acres	Management Discretion
	2004 Stuart Soybeans	March 31 Acres	Management Discretion
Sales & Marketing	Corn-Bean Profit Centers	Bushels	Sales \$
General & Administrative	Corn-Bean Profit Centers	Bushels	Sales \$
Financing	Corn-Bean Profit Centers	\$ of Assets	Sales \$

Sample Financial Reports

The following sample financial reports are generated for the case study of the Carl and Clara Cyclone operation. Software from FBS Systems, Inc. has been used to generate the reports that will incorporate the cost and profit center design outlined above.

Two treatments of government payments are presented. Under the *FSA Scenario 1*, FSA Direct and Countercyclical payments are posted directly to the Corn and Soybean profit centers, creating a period revenue. Under the *FSA Scenario 2*, FSA Direct and Countercyclical payments are posted directly to the appropriate farm sites, reducing work-in-process and finished goods costs.

Center: CG00 CROP PRODUCTION						
Depreciation	1,865.01	1,865.01	1,865.01	1,865.01	7,460.04	
ISUE	0.00	0.00	4.00	0.00	4.00	
NCC	1,120.00	2,607.94	1,840.15	340.00	5,908.09	
Urness	0.00	0.00	4.26	0.00	4.26	
CG00 CROP PRODUCTION	2,985.01	4,472.95	3,713.42	2,205.01	13,376.39	
Dollars Allocated From	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	
CG00 CROP PRODUCTION	2,985.01	4,472.95	3,713.42	2,205.01	13,376.39	
BSP00 SHOP & MAINTENANCE	123.08	123.08	123.08	123.08	492.32	
EP0000 Employee Prod	2,550.00	2,550.00	2,550.00	2,550.00	10,200.00	
EQ1000 Power Units	0.00	0.00	0.00	122.83	122.83	
EQ1001 JD 8400	4,085.25	263.14	0.00	0.00	4,348.39	
EQ1002 JD 4020	0.00	0.00	20.75	581.78	602.53	
EQ1003 JD 620	0.00	0.00	0.00	33.41	33.41	
EQ1004 Hagie 280	435.66	334.76	489.79	0.00	1,260.21	
EQ2000 Plant	0.00	1,671.75	0.00	0.00	1,671.75	
EQ3000 Tillage	0.00	389.45	0.00	0.00	389.45	
EQ4000 Growing	554.22	42.35	352.83	0.00	949.40	
EQ9001 Chev Pickup	59.48	7.88	56.03	23.71	147.10	
Totals	10,792.70	9,855.36	7,305.90	5,639.82	33,593.78	
Standard Costs \$	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	
100104 Corn Own Farm 04	0.00	2,854.50	1,171.50	635.25	4,661.25	
100204 Corn Elmer Farm 04	0.00	3,619.00	723.80	294.25	4,637.05	
100304 Corn Ward Farm 04	0.00	2,103.75	420.75	0.00	2,524.50	
100404 Corn Schroder Frm 04	0.00	1,729.75	565.95	345.95	2,641.65	
100504 Corn Library Farm 04	0.00	2,136.75	427.35	427.35	2,991.45	
200104 SoyB Own Farm 04	0.00	2,464.00	357.50	0.00	2,821.50	
200204 SoyB Elmer Farm 04	0.00	2,634.50	137.50	0.00	2,772.00	
200304 SoyB Ward Farm 04	0.00	2,103.75	0.00	0.00	2,103.75	
200404 SoyB Schrdr Farm 04	0.00	1,793.00	448.25	0.00	2,241.25	
200504 SoyB Library Farm 04	0.00	1,709.40	427.35	0.00	2,136.75	
200604 SoyB Stuart Farm 04	0.00	1,760.00	220.00	0.00	1,980.00	
Total Standard Costs	0.00	24,908.40	4,899.95	1,702.80	31,511.15	
Variance	-10,792.70	15,053.04	-2,405.95	-3,937.02	-2,082.63	
Center/Oper Acres	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	
Cost Driver Units	0.00	4,528.80	890.90	309.60	5,729.30	
Standard	0.00	5.50	5.50	5.50	5.50	
Actual	0.00	2.18	8.20	18.22	5.86	
Variance	0.00	3.32	-2.70	-12.72	-0.36	

Figure 23. Crop Production Support Cost Center Activity Report

Note the \$4,661.25 standard costs allocated to Corn Own Farm 04 which will reappear in Figure 23. The \$5.50 per center/operation acre was determined by the cost driver in Figure 23. The actual result (period costs allocated to the Crop Production support cost center) was \$33,593.78 as compared to \$31,511.15 allocated out to the crop production centers resulting in a \$2,082.63 total variance or \$0.36 per center/operation acres. Unless adjusted, this variance will "flush through" the income statement in the period.

Figure 24 shows the allocations of period costs into the Sales & Marketing support cost center and the allocations out to the Corn and Soybean profit centers.

Description	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Center: CS00 SALES & MARKETING					
C H NonLinked	0.00	0.00	118.01	0.00	118.01
C H Trucking	0.00	0.00	117.23	0.00	117.23
MK Checkoff	256.90	0.00	194.75	164.71	616.36
MK Commissions	0.00	0.00	320.00	0.00	320.00
SALES & MARKETING	256.90	0.00	749.99	164.71	1,171.60
Dollars Allocated From	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
SALES & MARKETING	256.90	0.00	749.99	164.71	1,171.60
GMC Truck	1,541.27	108.60	0.00	1,061.68	2,711.55
Totals	1,798.17	108.60	749.99	1,226.39	3,883.15
Dollars Allocated To	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Corn Profit Center	899.09	54.30	375.00	613.20	1,941.58
SoyB Profit Center	899.09	54.30	375.00	613.20	1,941.58

Figure 24. Period Expense Activity Report

Figure 25 shows the \$5.50/acre Crop Production support cost center charge for each trip across the field by crop production equipment.

Center	Project Id	Entry Type	Date	No.	Description	Quantity	Acres	Value	Cost Driver	\$/Unit
Corn Own Farm 04	100104A	Expense	01/31/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Corn Own Farm 04	100104A	Expense	02/29/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Corn Own Farm 04	100104A	Expense	03/31/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Corn Own Farm 04	100104A	Expense	03/31/2004		Farm Site	78.00		2,574.00	User Center Acres	33.00
Corn Own Farm 04	100104A	Expense	04/30/2004		Crop Production	156.00		858.00	Center/Oper Acres	5.50
Corn Own Farm 04	100104A	Expense	04/30/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Corn Own Farm 04	100104A	Expense	05/31/2004		Crop Production	78.00		429.00	Center/Oper Acres	5.50
Corn Own Farm 04	100104A	Expense	05/31/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Corn Own Farm 04	100104A	Expense	06/30/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Corn Own Farm 04	100104A	Expense	07/31/2004		Crop Production	78.00		429.00	Center/Oper Acres	5.50
Corn Own Farm 04	100104A	Expense	07/31/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Corn Own Farm 04	100104A	Expense	08/31/2004		Crop Production	78.00		429.00	Center/Oper Acres	5.50
Corn Own Farm 04	100104A	Expense	08/31/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Corn Own Farm 04	100104A	Expense	09/26/2004	74600	Insurance	0.00		907.00		
Corn Own Farm 04	100104A	Expense	09/30/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Corn Own Farm 04	100104A	Expense	10/31/2004		Crop Production	78.00		429.00	Center/Oper Acres	5.50
Corn Own Farm 04	100104A	Expense	10/31/2004		Crop Harvesting	78.00		1,638.00	Center/Oper Acres	21.00
Corn Own Farm 04	100104A	Expense	10/31/2004		Farm General	6.50		175.50	Center/Field Acres	27.00
Total Expense						0.00	689.00	9,448.00		13.71

Figure 25. Work Paper for Field Projects under Corn Own Farm 2004

Figure 26 shows the inputs used on the field and the automatic internal sale of work-in-process crop from the production cost center to finished goods in the marketing center.

Center	Project Id	Entry Type	Date	No.	Description	Quantity	Acres	Value	Cost Driver	\$/Unit
Corn Own Farm 04	100104C	Seed	04/29/2004	5245	Dekalb 5245	4.00	10.00	444.89		44.49
Corn Own Farm 04	100104C	Seed	04/29/2004	4884	Dekalb 4884	4.00	9.50	419.65		44.17
Total Seed						8.00	19.50	864.54		44.34
Corn Own Farm 04	100104C	Chemical	04/07/2004	16	Outlook	4.00	19.50	375.02		19.23
Corn Own Farm 04	100104C	Chemical	05/18/2004	25	Callisto	0.25	19.50	112.75		5.78
Corn Own Farm 04	100104C	Chemical	05/18/2004	2	Atrazine	3.25	19.50	31.53		1.62
Corn Own Farm 04	100104C	Chemical	05/18/2004	24	DOC	2.00	19.50	10.52		0.54
Corn Own Farm 04	100104C	Chemical	05/18/2004	14	AMS	38.25	19.50	6.63		0.34
Corn Own Farm 04	100104C	Chemical	08/16/2004	12	Weedar LV6	3.33	19.50	65.43		3.36
Total Chemical						51.08	117.00	601.88		5.14
Corn Own Farm 04	100104C	Fertilizer	11/13/2003	1	Anhyd-Ammonia	1.96	19.50	652.82		33.48
Total Fertilizer						1.96	19.50	652.82		33.48
Corn Own Farm 04	100104C	Harvest	10/26/2004	03	Government Bin 3	2,812.40	19.50	4,484.73		1.59
Total Harvest						2,812.40	19.50	4,484.73		1.59
Corn Own Farm 04	100104C	Crop Sale	10/26/2004	M32000	Internal Crop Sales	2,812.40		4,484.73	Internal sales to Marketing Center	1.59
Total Crop Sale						2,812.40		4,484.73		1.59

Figure 26. Work Paper for another field project under Corn Own Farm 04

Figure 27 showing the internal work-in-process adjustments as expenses are incurred and the reversal of those adjustments when the crop is harvested.

Center	Project Id	Entry Type	Date	No.	Description	Quantity	Acres	Value
Corn Own Farm 04	100104C	Wip	01/31/2004	asfarm	Farm General Assign			-43.88
Corn Own Farm 04	100104C	Wip	02/29/2004	asfarm	Farm General Assign			-43.88
Corn Own Farm 04	100104C	Wip	03/31/2004	asfarm	Farm General Assign			-43.88
Corn Own Farm 04	100104C	Wip	03/31/2004	assite	Site Assignment			-643.50
Corn Own Farm 04	100104C	Wip	04/30/2004	ascrop	Crop Production Assi			-321.75
Corn Own Farm 04	100104C	Wip	04/30/2004	asfarm	Farm General Assign			-43.88
Corn Own Farm 04	100104C	Wip	04/30/2004	78505	SP NonLink			-864.54
Corn Own Farm 04	100104C	Wip	04/30/2004	62005	CH Crp Chem NonLink			-375.02
Corn Own Farm 04	100104C	Wip	05/31/2004	ascrop	Crop Production Assi			-107.25
Corn Own Farm 04	100104C	Wip	05/31/2004	asfarm	Farm General Assign			-43.88
Corn Own Farm 04	100104C	Wip	05/31/2004	62005	CH Crp Chem NonLink			-161.43
Corn Own Farm 04	100104C	Wip	06/30/2004	ascrop	Crop Production Assi			-107.25
Corn Own Farm 04	100104C	Wip	06/30/2004	asfarm	Farm General Assign			-43.88
Corn Own Farm 04	100104C	Wip	07/31/2004	asfarm	Farm General Assign			-43.88
Corn Own Farm 04	100104C	Wip	08/31/2004	ascrop	Crop Production Assi			-107.25
Corn Own Farm 04	100104C	Wip	08/31/2004	asfarm	Farm General Assign			-43.88
Corn Own Farm 04	100104C	Wip	08/31/2004	62005	CH Crp Chem NonLink			-65.43
Corn Own Farm 04	100104C	Wip	09/30/2004	asfarm	Farm General Assign			-43.88
Corn Own Farm 04	100104C	Wip	09/30/2004	74600	INSURANCE Prod			-230.24
Corn Own Farm 04	100104C	Wip	10/31/2004	ascrop	Crop Production Assi			643.50
Corn Own Farm 04	100104C	Wip	10/31/2004	asfarm	Farm General Assign			394.92
Corn Own Farm 04	100104C	Wip	10/31/2004	assite	Site Assignment			643.50
Corn Own Farm 04	100104C	Wip	10/31/2004	74600	INSURANCE Prod			230.24
Corn Own Farm 04	100104C	Wip	10/31/2004	78505	SP NonLink			864.54
Corn Own Farm 04	100104C	Wip	10/31/2004	62005	CH Crp Chem NonLink			601.88
Corn Own Farm 04	100104C	Wip	10/31/2004	72005	F&L NonLink			652.82
Total Wip								652.82
					Harvest			4,484.73
					Crop Transfer/Sold			4,484.73
					Period Seed			864.54
					Period Chemicals			601.88
					Period Expense			2,365.54
					Wip Fert Adjustment			652.82
					Total Expenses			3,831.96

Figure 27. Work Paper for Field Project

Note the \$4,661.25 allocation matches the Crop Production Support Cost Center Activity Report in Figure 3.

	ACTUAL VALUE	% of TOTAL	ACTUAL PER BU	ACTUAL PER ACRE
REVENUE				
Internal Sales Mkt. Center	26,839.47	100.00	1.04	198.81
Total REVENUE	26,839.47	100.00	1.04	198.81
DIRECT PRODUCTION COSTS				
Chemicals	3,216.58	27.14	0.12	23.83
Seed	3,313.93	27.96	0.13	24.55
Fertilizer	1,714.62	14.47	0.07	12.70
Fertilizer WIP Adj.	2,025.59	17.09	0.08	15.00
Crop Insurance	1,580.00	13.33	0.06	11.70
Total DIRECT PRODUCTION COSTS	11,850.72	100.00	0.46	87.78
INDIRECT PROD. COSTS				
Site Costs	4,455.00	29.72	0.17	33.00
Farm General	3,037.60	20.27	0.12	22.50
Crop Production	4,661.25	31.10	0.18	34.53
Crop Harvest	2,835.00	18.91	0.11	21.00
Total INDIRECT PROD. COSTS	14,988.85	100.00	0.58	111.03
TOTAL PRODUCTION COSTS	26,839.57		1.04	198.81
PROD. COSTS NET OF REVENUE	-0.10		0.00	0.00

Figure 28. Production Cost Center Activity Report for Corn Own Farm 2004

	100104A \$Ent/Field: 100104	100104B Ent/Field: 100104	100104C Ent/Field: 100104	Totals
REVENUE				
Internal Sales Mkt. Center	100.00	0.88	1.20	1.04
Total REVENUE	0.88	1.20	1.59	1.04
DIRECT PRODUCTION COSTS				
Chemicals	100.00	0.11	0.12	0.13
Seed	100.00	0.06	0.21	0.13
Fertilizer	100.00	0.11	0.20	0.15
Crop Insurance	100.00	0.06	0.06	0.06
Total DIRECT PRODUCTION COSTS	0.34	0.58	0.84	0.46
INDIRECT PROD. COSTS				
Site Costs	100.00	0.16	0.18	0.17
Farm General	100.00	0.11	0.12	0.12
Crop Production	100.00	0.16	0.21	0.18
Crop Harvest	100.00	0.10	0.11	0.11
Total INDIRECT PROD. COSTS	0.54	0.61	0.76	0.58
TOTAL PRODUCTION COSTS	0.88	1.20	1.59	1.04
PROD. COSTS NET OF REVENUE	0.00	0.00	0.00	0.00

Figure 29. Production Cost Center Activity Report (Per Bushel)
for all Field Projects in Corn Own Farm 2004

		100104 Corn Own Farm 04	100204 Corn Ward Farm 04	100304 Corn Schroder Frm 04	100404 Corn Library Farm 04	100504 Corn Library Farm 04	Totals
	BU:	25,741.600	21,686.700	12,292.000	10,052.000	13,675.000	83,447.300
	Acres:	135.00	131.60	76.50	62.90	77.70	483.70
REVENUE							
Internal Sales Mkt. Center	100.00	26,839.47	18,222.59	10,054.86	21,062.12	28,853.92	105,032.96
Total REVENUE		26,839.47	18,222.59	10,054.86	21,062.12	28,853.92	105,032.96
DIRECT PRODUCTION COSTS							
Chemicals	100.00	3,216.58	3,088.41	1,701.14	1,586.14	1,738.64	11,330.91
Seed	100.00	3,313.93	5,642.86	3,795.83	2,693.23	3,584.64	19,030.49
Fertilizer	100.00	1,714.62	0.00	0.00	0.00	0.00	1,714.62
Fertilizer WIP Adj.	100.00	2,025.59	2,067.30	1,224.23	2,183.44	4,896.04	12,396.60
Crop Insurance	100.00	1,580.00	770.00	400.00	730.00	919.00	4,399.00
Landlord Reimbursement	100.00	0.00	-4,365.69	-2,918.61	0.00	0.00	-7,284.30
Total DIRECT PRODUCTION COSTS		11,850.72	7,202.88	4,202.59	7,192.81	11,138.32	41,587.32
INDIRECT PROD. COSTS							
Site Costs	100.00	4,455.00	658.00	0.00	8,491.50	11,344.20	24,948.70
Farm General	100.00	3,037.60	2,960.90	1,721.30	1,415.30	1,748.30	10,883.40
Crop Production	100.00	4,661.25	4,637.05	2,524.50	2,641.65	2,991.45	17,455.90
Crop Harvest	100.00	2,835.00	2,763.60	1,606.50	1,320.90	1,631.70	10,157.70
Total INDIRECT PROD. COSTS		14,988.85	11,019.55	5,852.30	13,869.35	17,715.65	63,445.70
TOTAL PRODUCTION COSTS		26,839.57	18,222.43	10,054.89	21,062.16	28,853.97	105,033.02
PROD. COSTS NET OF REVENUE		-0.10	0.16	-0.03	-0.04	-0.05	-0.06

Figure 30. Production Cost Center Activity Report (Totals) for all 2004 Corn Centers

		200104 SoyB Own Farm 04	200204 SoyB Ward Farm 04	200304 SoyB Schrdr Farm 04	200404 SoyB Library Farm 04	200504 SoyB Library Farm 04	200604 SoyB Stuart Farm 04	Totals
	BU:	5,894.200	6,931.200	3,672.800	4,080.000	3,788.600	4,253.100	28,619.900
	Acres:	112.00	132.90	76.50	81.50	77.70	80.00	560.60
REVENUE								
Internal Sales Mkt. Center	100.00	156.68	88.51	95.58	259.60	293.74	109.87	159.46
Total REVENUE		156.68	88.51	95.58	259.60	293.74	109.87	159.46
DIRECT PRODUCTION COSTS								
Chemicals	100.00	9.81	8.06	17.13	11.94	11.46	9.43	10.88
Chemical WIP Adj.	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seed	100.00	29.72	26.79	18.33	24.38	28.82	30.54	26.69
Seed WIP Adj.	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertilizer	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertilizer WIP Adj.	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom Work	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crop Insurance	100.00	17.71	8.97	8.56	17.28	17.70	8.63	13.03
Landlord Reimbursement	100.00	0.00	-17.42	-19.44	0.00	0.00	-19.99	-9.64
Total DIRECT PRODUCTION COSTS		57.24	26.40	24.58	53.60	57.99	28.62	40.96
INDIRECT PROD. COSTS								
Site Costs	100.00	33.00	0.00	0.00	135.00	146.00	13.00	48.31
Farm General	100.00	20.25	20.25	22.50	22.50	20.25	22.50	21.21
Crop Production	100.00	25.19	20.86	27.50	27.50	27.50	24.75	25.07
Crop Harvest	100.00	21.00	21.00	21.00	21.00	42.00	21.00	23.91
Total INDIRECT PROD. COSTS		99.44	62.11	71.00	206.00	235.75	81.25	118.50
TOTAL PRODUCTION COSTS		156.68	88.51	95.58	259.60	293.74	109.87	159.46
PROD. COSTS NET OF REVENUE		0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 31. Production Cost Center Activity Report (Per Acre) for all 2004 Soybean Centers

The first three columns represent the three field projects in this center.

(CCC04) Inventory By Project				
Center	100104	100104	100104	
Project Id	100104A	100104B	100104C	Totals
Remaining Acres	78	38	20	135
Remaining Units	10,530	5,063	2,633	18,225
Seed	12.63	39.05	44.34	24.55
Chemicals	18.96	18.67	27.51	20.11
Fertilizer	21.98	36.61	33.48	27.71
Fuel	0.00	0.00	0.00	0.00
Custom Work	0.00	0.00	0.00	0.00
Custom Hire	0.00	0.00	0.00	0.00
Crop Production	16.50	27.50	27.50	21.14
Crop Harvesting	0.00	0.00	0.00	0.00
Crop Processing	0.00	0.00	0.00	0.00
Farm General	13.50	13.50	13.50	13.50
Farm Site	33.00	33.00	33.00	33.00
Cash Rent	0.00	0.00	0.00	0.00
Commercial Drying	0.00	0.00	0.00	0.00
Storage	0.00	0.00	0.00	0.00
Insurance	0.00	0.00	0.00	0.00
Crop Purchases	0.00	0.00	0.00	0.00
Sales Cost Reducer	0.00	0.00	0.00	0.00
Crop Cost/Acre	116.57	168.32	179.32	140.01
Crop Cost/Unit				
Total Inv. @ Cost	9,092.66	6,311.95	3,496.81	18,901.42
TA+ Ledger Amount				18,901.48

**Figure 32. Corn Own Farm Production Cost Center
Work in Process Report as of 6/30/04**

Center: CS1000 Corn Market

Project: CornMkt04 Corn Marketing 2004

CS1000 - CornMkt04 -CS1000 Corn

	Harvested	Remaining	Sold
Quantity	66,457.95	56,544.54	9,913.41
Cost/Unit	1.76	1.76	1.76

	Production	Total	Remaining	Sold
Quantity	66,457.95	66,457.95	56,544.54	9,913.41
Acres	483.70	483.70	0.00	483.70
Seed	0.22	0.00	0.22	0.22
Chemicals	0.13	0.00	0.13	0.13
Fertilizer	0.21	0.00	0.21	0.21
Fuel	0.00	0.00	0.00	0.00
Custom Hire	0.00	0.00	0.00	0.00
Custom Hire	0.00	0.00	0.00	0.00
Crop Production	0.26	0.00	0.26	0.26
Crop Harvesting	0.15	0.00	0.15	0.15
Crop Processing	0.00	0.18	0.18	0.18
Farm General	0.16	0.00	0.16	0.16
Farm Site	0.38	0.00	0.38	0.38
Cash Rent	0.00	0.00	0.00	0.00
Commercial Drying	0.00	0.00	0.00	0.00
Storage	0.00	0.00	0.00	0.00
Insurance	0.07	0.00	0.07	0.07
Crop Purchases	0.00	0.00	0.00	0.00
Sales Reducer	0.00	0.00	0.00	0.00
Total Dollars	105,032.92	11,962.43	99,543.37	17,451.98
Dollars/Unit	1.58	0.18	1.76	1.76
Dollars/Acre	217.14	24.73	99,543.37	36.08

**Figure 33. Corn Marketing Center 2004 Project Finished
Goods Inventory (per bushel option).**

		200104 SoyB Own Farm 04	200204 SoyB Elmer Farm 04	200304 SoyB Ward Farm 04	200404 SoyB Library Farm 04	200504 SoyB Stuart Farm 04	200604 SoyB Stuart Farm 04	Totals
	BU:	5,894.200	6,931.200	3,672.800	4,080.000	3,788.600	4,253.100	28,619.900
	Acres:	112.00	132.90	76.50	81.50	77.70	80.00	560.60
REVENUE								
Internal Sales Mkt. Center	100.00	156.68	88.51	95.58	259.60	293.74	109.87	159.46
Total REVENUE		156.68	88.51	95.58	259.60	293.74	109.87	159.46
DIRECT PRODUCTION COSTS								
Chemicals	100.00	9.81	8.06	17.13	11.94	11.46	9.43	10.88
Chemical WIP Adj.	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seed	100.00	29.72	26.79	18.33	24.38	28.82	30.54	26.69
Seed WIP Adj.	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertilizer	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertilizer WIP Adj.	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom Work	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crop Insurance	100.00	17.71	8.97	8.56	17.28	17.70	8.63	13.03
Landlord Reimbursement	100.00	0.00	-17.42	-19.44	0.00	0.00	-19.99	-9.64
Total DIRECT PRODUCTION COSTS		57.24	26.40	24.58	53.60	57.99	28.62	40.96
INDIRECT PROD. COSTS								
Site Costs	100.00	33.00	0.00	0.00	135.00	146.00	13.00	48.31
Farm General	100.00	20.25	20.25	22.50	22.50	20.25	22.50	21.21
Crop Production	100.00	25.19	20.86	27.50	27.50	27.50	24.75	25.07
Crop Harvest	100.00	21.00	21.00	21.00	21.00	42.00	21.00	23.91
Total INDIRECT PROD. COSTS		99.44	62.11	71.00	206.00	235.75	81.25	118.50
TOTAL PRODUCTION COSTS		156.68	88.51	95.58	259.60	293.74	109.87	159.46
PROD. COSTS NET OF REVENUE		0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 34. Production Cost Center Activity Report
(Per Acre) for all 2004 Soybean Centers

Center: CS1000 Corn Market			Harvested	Remaining	Sold	
Project: CornMkt04 Corn Marketing 2004			Quantity	66,457.95	56,544.54	9,913.41
CS1000 - CornMkt04 -CS1000 Cornv			Cost/Unit	1.76	1.76	1.76
	Production	Total	Remaining	Sold		
Quantity	66,457.95	66,457.95	56,544.54	9,913.41		
Acres	483.70	483.70	0.00	483.70		
Seed	14,311.15	0.00	12,176.38	2,134.77		
Chemicals	8,766.02	0.00	7,458.41	1,307.61		
Fertilizer	14,111.22	0.00	12,006.27	2,104.94		
Fuel	0.00	0.00	0.00	0.00		
Custom Hire	0.00	0.00	0.00	0.00		
Custom Hire	0.00	0.00	0.00	0.00		
Crop Production	17,455.90	0.00	14,852.04	2,603.86		
Crop Harvesting	10,157.70	0.00	8,642.49	1,515.21		
Crop Processing	0.00	11,962.43	10,178.02	1,784.41		
Farm General	10,883.24	0.00	9,259.81	1,623.43		
Farm Site	24,948.70	0.00	21,227.15	3,721.55		
Cash Rent	0.00	0.00	0.00	0.00		
Commercial Drying	0.00	0.00	0.00	0.00		
Storage	0.00	0.00	0.00	0.00		
Insurance	4,399.00	0.00	3,742.81	656.19		
Crop Purchases	0.00	0.00	0.00	0.00		
Sales Reducer	0.00	0.00	0.00	0.00		
Total Dollars	105,032.92	11,962.43	99,543.37	17,451.98		
Dollars/Unit	1.58	0.18	1.76	1.76		
Dollars/Acre	217.14	24.73	99,543.37	36.08		

Figure 35. Corn Marketing Center 2004 Project Finished
Goods Inventory (Total Dollars Option)

UNIT NAME	CS00 SALES & MARKETING	GC&A G&A	FIN00 FINANCE	CP01 Corn Profit Center	CP02 SoyB Profit Center	Totals
GOVERNMENT PAYMENT	0.00	0.00	0.00	27,642.51	3,264.75	30,907.26
OTHER REVENUE	0.00	0.00	0.00	5,001.00	0.00	5,001.00
F.O.G.L Production	492.20	0.00	0.00	0.00	0.00	492.20
INSURANCE G&A	0.00	115.52	0.00	1,478.53	1,478.53	3,072.58
MARKETING						
MK Checkoff	0.00	0.00	0.00	308.18	308.18	616.36
MK Commissions	0.00	0.00	0.00	160.00	160.00	320.00
Total MARKETING	0.00	0.00	0.00	468.18	468.18	936.36
MISCELLANEOUS						
MI Dues/Subscript	0.00	0.00	0.00	1,043.97	1,043.97	2,087.94
MI Other	0.00	3.75	0.00	4,964.64	1,186.64	6,155.02
MI Trvl Lodging	0.00	0.00	0.00	79.03	79.03	158.05
MI Trvl Meals/Enter	0.00	0.00	0.00	229.53	229.53	459.06
MI Trvl Mileage	0.00	0.00	0.00	158.75	158.75	317.50
Total MISCELLANEOUS	0.00	3.75	0.00	6,475.91	2,697.91	9,177.57
RENT & LEASE						
RM G&A Vehicles	0.00	10.90	0.00	0.00	0.00	10.90
RM Production Eq.	1,885.75	0.00	0.00	0.00	0.00	1,885.75
Total RENT & LEASE	1,885.75	10.90	0.00	0.00	0.00	1,896.65
SUPPLIES						
Supplies G&A	0.00	0.68	0.00	22.73	22.73	46.13
Total SUPPLIES	0.00	0.68	0.00	22.73	22.73	46.13
TAXES & LICENSE						
T&L G&A	0.00	16.25	0.00	0.00	0.00	16.25
Total TAXES & LICENSE	0.00	16.25	0.00	0.00	0.00	16.25
UTILITIES						
UT G&A Electricity	0.00	0.00	0.00	987.31	987.31	1,974.61
UT G&A LP	0.00	0.00	0.00	32.63	32.63	65.26
UT G&A Telephone	0.00	0.00	0.00	202.83	202.83	405.65
Total UTILITIES	0.00	0.00	0.00	1,222.76	1,222.76	2,445.52
CAPITAL						
CA Interest ST - CCC	0.00	0.00	148.17	0.00	0.00	148.17
CA Int LT Non Real E	0.00	0.00	5,279.17	0.00	0.00	5,279.17
CA Int LT Mortgage	0.00	0.00	9,959.75	0.00	0.00	9,959.75
Total CAPITAL	0.00	0.00	15,387.09	0.00	0.00	15,387.09

Figure 36. Period Expense Activity Report for the Sales & Marketing, General & Administrative and Finance Support Cost Centers and the Corn/Soybean Profit Centers

Figure 37 is computed by combining the Corn Profit Center and the Corn Marketing Center.

	ACTUAL VALUE	% of TOTAL	ACTUAL PER BU
REVENUE			
Crop Sales	159,203.44	85.21	2.24
Government Payment	27,642.51	14.79	0.39
Total REVENUE	186,845.95	100.00	2.63
PRODUCTION EXPENSES			
Production Stage	105,032.96	93.85	1.58
Inventory Adjustment	6,880.66	6.15	
Total PRODUCTION EXPENSES	111,913.62	100.00	1.58
SUPPORT COST CENTERS			
Corn Processing	5,177.79	92.69	0.07
Storage	408.27	7.31	0.01
Total SUPPORT COST CENTERS	5,586.06	100.00	0.08
COST OF GOODS SOLD	117,499.68		1.66
PRODUCTION MARGIN	69,346.27		0.98
SALES & GENERAL			
Sales & Marketing	1,941.58	26.13	0.03
G&A	5,489.33	73.87	0.08
Total SALES & GENERAL	7,430.91	100.00	0.10
OPERATING MARGIN	61,915.36		0.87
OTHER EXPENSE			
Interest Expense	7,729.69	100.00	0.11
Total OTHER EXPENSE	7,729.69	100.00	0.11
TOTAL EXPENSE	132,660.27		1.87
NET INCOME BEFORE TAX	54,185.68		0.76

Figure 37. Corn Profit Center Report for Calendar 2004

Figure 38 shows the Calendar 2004 computed by combining the Soybean Profit Center and the Soybean Marketing Center.

	ACTUAL VALUE	% of TOTAL	ACTUAL PER BU
REVENUE			
Crop Sales	119,968.28	97.35	7.63
Government Payment	3,264.75	2.65	0.21
Total REVENUE	123,233.03	100.00	7.84
PRODUCTION EXPENSES			
Production Stage	89,393.26	111.60	4.22
Inventory Adjustment	-9,288.47	-11.60	
Total PRODUCTION EXPENSES	80,104.79	100.00	5.10
SUPPORT COST CENTERS			
SoyB Processing	358.00	44.22	0.02
Storage	451.61	55.78	0.03
Total SUPPORT COST CENTERS	809.61	100.00	0.05
COST OF GOODS SOLD	80,914.40		5.15
PRODUCTION MARGIN	42,318.63		2.69
SALES & GENERAL			
Sales & Marketing	1,941.58	26.13	0.12
G&A	5,489.33	73.87	0.35
Total SALES & GENERAL	7,430.91	100.00	0.47
OPERATING MARGIN	34,887.72		2.22
OTHER EXPENSE			
Interest Expense	7,729.69	100.00	0.49
Total OTHER EXPENSE	7,729.69	100.00	0.49
TOTAL EXPENSE	96,074.99		6.11
NET INCOME BEFORE TAX	27,158.04		1.73

Figure 38. Soybean Profit Center Report for Calendar 2004

	Current Period	Period % of Tot.	Current YTD	YTD % of Tot.
INCOME				
Crop Sales	279,171.72	85.21	279,171.72	85.21
Inventory Adjustment	10,667.54	4.32	10,667.54	4.32
Government Payment	30,907.26	9.43	30,907.26	9.43
Other Revenue	5,001.00	1.53	5,001.00	1.53
Patronage Dividend	1,880.00	0.57	1,880.00	0.57
TOTAL INCOME	327,627.52		327,627.52	
PRODUCTION EXPENSES				
Chemicals	13,386.25	5.42	13,386.25	5.42
Custom Hire	1,624.35	0.66	1,624.35	0.66
Depreciation Prod.	30,830.04	12.49	30,830.04	12.49
Fertilizer & Lime	14,111.19	5.72	14,111.19	5.72
Fuel, Oil, Gas & LP Prod	15,569.04	6.31	15,569.04	6.31
Insurance Prod	11,982.20	4.85	11,982.20	4.85
Labor & Management Prod.	20,400.00	8.26	20,400.00	8.26
Miscellaneous	10,437.83	4.23	10,437.83	4.23
Rent & Lease Production	44,244.00	17.92	44,244.00	17.92
Repairs & Maint. Prod.	18,939.92	7.67	18,939.92	7.67
Seeds & Plants	25,901.07	10.49	25,901.07	10.49
Supplies Prod	233.23	0.09	233.23	0.09
Taxes & Licenses Prod.	5,492.46	2.22	5,492.46	2.22
Utilities Production	581.05	0.24	581.05	0.24
Total PRODUCTION EXPENSES	213,732.63	86.57	213,732.63	86.57
COST OF GOODS SOLD	213,732.63	86.57	213,732.63	86.57
PRODUCTION MARGIN	113,894.89	46.13	113,894.89	46.13
OPERATING EXPENSES				
Sales & Marketing	1,342.73	0.54	1,342.73	0.54
Insurance G&A	3,604.12	1.46	3,604.12	1.46
Fuel, Oil, Gas & LP G&A	1,045.12	0.42	1,045.12	0.42
Labor & Management G&A	3,600.00	1.46	3,600.00	1.46
Supplies G&A	434.95	0.18	434.95	0.18
Taxes & Licenses G&A	2,878.00	1.17	2,878.00	1.17
Repairs & Maint. G&A	1,462.98	0.59	1,462.98	0.59
Utilities G&A	3,416.35	1.38	3,416.35	1.38
Total OPERATING EXPENSES	17,784.25	7.20	17,784.25	7.20
OPERATING MARGIN	96,110.64	38.93	96,110.64	38.93
FINANCING EXPENSES				
Interest Expense	15,387.09	6.23	15,387.09	6.23
Total FINANCING EXPENSES	15,387.09	6.23	15,387.09	6.23
NF INCOME FR OPERATIONS	80,723.55	32.69	80,723.55	32.69
NET INCOME B/F TAXES	80,723.55	32.69	80,723.55	32.69

Figure 39. Entity Income Statement

December 31, 2004		December 31, 2004	
CURRENT ASSETS		CURRENT LIABILITIES	
Checking Accounts	54,358.44	A/man Interst	8,211.00
Accounts Receivable	107.53	A/man Property Taxes	7,720.00
Total CURRENT ASSETS	54,465.97	Operating Loans	14,455.00
INVENTORY		Total CURRENT LIABILITIES	30,386.00
INV Crop Growing	22,977.70	LONG TERM LIAB	
INV Crop Harv/Store	174,452.24	Notes Payable	76,110.12
INV Chemicals	102.16	NP Real Estate	129,197.04
Total INVENTORY	197,532.10	Deferred Taxes	111,761.00
LONG TERM ASSETS		Total LONG TERM LIAB	317,068.16
Building&Improvmnts	11,754.30	Total Liabilities	347,454.16
Machinery & Equip	376,645.13	EQUITY	
A/D Mach & equip	-61,660.08	Contrib Capital	276,808.20
Total LONG TERM ASSETS	326,739.35	Inventory Adjustment	-606.03
INVESTMENTS		Current Year NI	80,723.55
Other Investments	52,977.17	Retained Earnings	440,088.40
Real Estate	734,550.00	Valuation Equity	221,796.31
Total INVESTMENTS	787,527.17	Total EQUITY	1,018,810.43
Total Assets	1,366,264.59	Total Liabilities & Members' Equity	1,366,264.59

Figure 40. Entity Balance Sheet

			12/31/04	07/01/04	12/31/04	07/01/04	12/31/04	07/01/04	Invty Valuation	Invty Valuation		
	CA Marketing		Unit	# Units	# Units	\$/Unit	\$/Unit	Total	Total	Change Due	Change Due	
	Inventories							Valuation	Valuation	To Quantity	To Cost	Net Change
CS1000	Corn Market	BU	56,544	16,094	1.78	1.78	100,904.80	28,613.40	71,916.43	373.19	72,291.40	
CS2000	Soybean Market	BU	17,058	2,289	4.31	5.60	73,547.44	12,823.38	82,752.84	-22,028.73	60,724.06	
Total Marketing Center Change							174,452.24	41,436.78	154,669.26	-21,655.54	133,015.46	
CA Investment In Growing Crops												
100104	Corn Own Farm 04	BU	0	0	0.00	0.00	0.00	18,901.48	0.00	0.00	-18,901.48	
100105	Corn Own Farm 05	BU	0	0	0.00	0.00	6,721.40	0.00	0.00	0.00	6,721.40	
100204	Corn Elmer Farm 04	BU	10,843	0	0.00	0.00	0.00	11,614.65	0.00	0.00	-11,614.65	
100205	Corn Elmer Farm 05	BU	0	0	0.00	0.00	2,237.70	0.00	0.00	0.00	2,237.70	
100304	Corn Ward Farm 04	BU	6,146	0	0.00	0.00	0.00	6,836.96	0.00	0.00	-6,836.96	
100305	Corn Ward Farm 05	BU	0	0	0.00	0.00	1,462.59	0.00	0.00	0.00	1,462.59	
100404	Corn Schroder Frm 04	BU	0	0	0.00	0.00	0.00	17,323.56	0.00	0.00	-17,323.56	
100405	Corn Schroder Frm 05	BU	0	0	0.00	0.00	6,282.07	0.00	0.00	0.00	6,282.07	
100504	Corn Library Farm 04	BU	0	0	0.00	0.00	349.71	24,526.64	0.00	0.00	-24,176.93	
100505	Corn Library Farm 05	BU	0	0	0.00	0.00	2,863.55	0.00	0.00	0.00	2,863.55	
100605	Corn Stuart Farm 05	BU	0	0	0.00	0.00	3,060.68	0.00	0.00	0.00	3,060.68	
200104	SoyB Own Farm 04	BU	0	0	0.00	0.00	0.00	12,980.44	0.00	0.00	-12,980.44	
200204	SoyB Elmer Farm 04	BU	3,466	0	0.00	0.00	0.00	7,379.68	0.00	0.00	-7,379.68	
200304	SoyB Ward Farm 04	BU	1,836	0	0.00	0.00	0.00	4,758.08	0.00	0.00	-4,758.08	
200404	SoyB Schrdr Farm 04	BU	0	0	0.00	0.00	0.00	17,264.81	0.00	0.00	-17,264.81	
200504	SoyB Library Farm 04	BU	0	0	0.00	0.00	0.00	17,704.33	0.00	0.00	-17,704.33	
200604	SoyB Stuart Farm 04	BU	2,127	0	0.00	0.00	0.00	5,810.44	0.00	0.00	-5,810.44	
Total Production Center Change							22,977.70	145,101.07	0.00	0.00	-122,123.37	
CA Chemical Inventory												
8	Glystar	gal	0	77	0.00	14.33	0.00	1,106.53	-1,106.53	0.00	-1,106.53	
12	Weedar LV6	gal	0	62	0.00	19.35	0.00	1,190.03	-1,190.03	0.00	-1,190.03	
14	AMS	lbs	0	564	0.00	0.17	0.00	95.89	-95.91	0.00	-95.89	
15	NIS	gal	0	7	0.00	13.28	0.00	92.96	-92.96	0.00	-92.96	
21	Asana	gal	0	15	0.00	76.21	0.00	1,124.10	-1,124.10	0.00	-1,124.10	
23	Cobra	gal	1	1	131.96	131.96	65.98	65.98	0.00	0.00	0.00	
24	COC	gal	2	2	5.26	5.26	10.52	10.52	0.00	0.00	0.00	
26	Salvan	gal	1	1	21.90	21.90	10.95	10.95	0.00	0.00	0.00	
Total Chemical Inventory Change							87.45	3,696.96	-3,609.53	0.00	-3,609.51	
Grand Total							197,517.39	190,234.81	151,059.73	-21,655.54	7,282.58	

Figure 41. Report of Inventory Change between 7/1/04 and 12/31/04

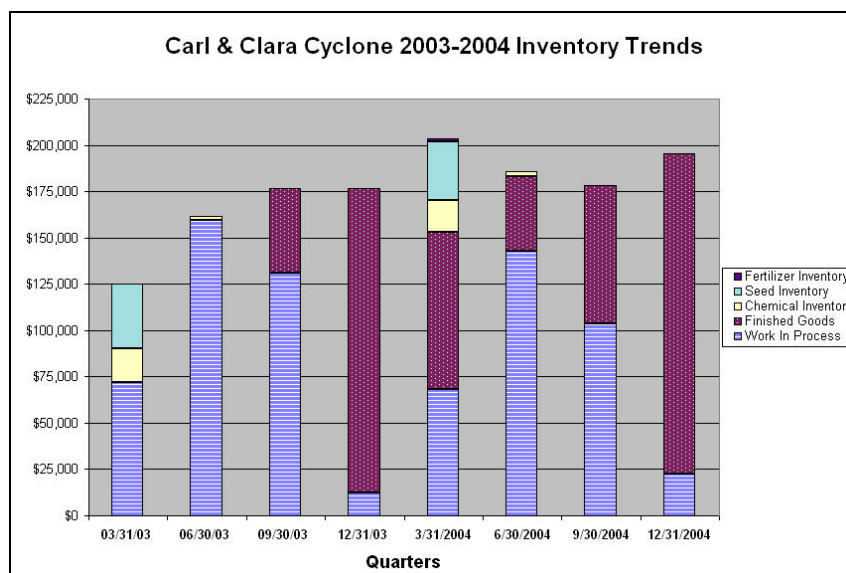


Figure 42. Inventory Trends Chart

Scenario 2 Reports

Many growers using FBS e.CLIPSE management accounting software prefer to assign FSA Direct and Countercyclical payments to the Farm Site support operation cost centers rather than to the commodity profit center. Instead of being treated as revenue, these payments become cost reducers to land cost, work in process, finished goods inventories and ultimately to cost of goods sold. The following reports depict the outcome.

Note that Government Payment is applied as a credit against taxes, rent and other land costs that at times can even result in a credit balance (negative) cost.

I Own Farm						
36000	GOVERNMENT PAYMENT	2,644.00	0.00	0.00	4,906.00	7,550.00
78701	T&L G&A	1,565.00	0.00	1,248.00	0.00	2,813.00
78750	T&L PROD	2,261.00	0.00	3,161.40	0.00	5,422.40
C01	I Own Farm	1,182.00	0.00	4,409.40	-4,906.00	685.40
	Standard Costs \$	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
100104	Corn Own Farm 04	373.96	0.00	0.00	0.00	373.96
200104	SoyB Own Farm 04	310.24	0.00	0.00	0.00	310.24
	Total Standard Costs	684.20	0.00	0.00	0.00	684.20
	Variance	-497.80	0.00	-4,409.40	-4,906.00	-1,200.00
	User Project Acres	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Cost Driver Units	247.00	0.00	0.00	0.00	247.00
	Standard	2.77	0.00	0.00	0.00	2.77
	Actual	4.79	0.00	0.00	0.00	4.79
	Variance	-2.02	0.00	0.00	0.00	-2.02
Elmer Farm						
36000	GOVERNMENT PAYMENT	1,387.00	0.00	0.00	2,701.00	4,088.00
77350	Mt Other	0.00	0.00	0.00	1,387.00	1,387.00
77900	R&L Production	0.00	0.00	0.00	650.00	650.00
C02	Elmer Farm	-1,387.00	0.00	0.00	-664.00	-2,051.00
	Standard Costs \$	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
100204	Corn Elmer Farm 04	0.00	0.00	0.00	-2,051.65	-2,051.65
	Total Standard Costs	0.00	0.00	0.00	-2,051.65	-2,051.65
	Variance	1,387.00	0.00	0.00	-1,387.65	-0.65
	User Project Acres	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Cost Driver Units	0.00	0.00	0.00	131.60	131.60
	Standard	0.00	0.00	0.00	-15.59	-15.59
	Actual	0.00	0.00	0.00	-5.05	-5.05
	Variance	0.00	0.00	0.00	-10.54	-10.54

Figure 43. Land (Site) Support Operation Cost Center Report

Note that site costs have been reduced from \$4,455.00 in Figure 44 to \$373.96, reducing total production costs from \$1.04 to \$0.88.

	ACTUAL VALUE	% of TOTAL	ACTUAL PER BU	ACTUAL PER ACRE
REVENUE				
Internal Sales Mkt. Center	22,758.43	100.00	0.88	168.58
Total REVENUE	22,758.43	100.00	0.88	168.58
DIRECT PRODUCTION COSTS				
Chemicals	3,216.58	27.14	0.12	23.83
Seed	3,313.93	27.96	0.13	24.55
Fertilizer	1,714.62	14.47	0.07	12.70
Fertilizer WIP Adj.	2,025.59	17.09	0.08	15.00
Crop Insurance	1,580.00	13.33	0.06	11.70
Total DIRECT PRODUCTION COSTS	11,850.72	100.00	0.46	77.78
INDIRECT PROD. COSTS				
Site Costs	373.96	3.43	0.01	2.77
Farm General	3,037.60	27.85	0.12	22.50
Crop Production	4,661.25	42.73	0.18	34.53
Crop Harvest	2,835.00	25.99	0.11	21.00
Total INDIRECT PROD. COSTS	10,907.81	100.00	0.42	80.80
TOTAL PRODUCTION COSTS	22,758.53		0.88	168.58
PROD. COSTS NET OF REVENUE	-0.10		0.00	0.00

Figure 44. Production Cost Center Activity Report for Corn Own Farm 04

Project Finished Goods Inventory is reduced from a \$1.76/bushel cost in Figure 45 to \$1.59.

Center: CS1000 Corn Market		Harvested	Remaining	Sold	
Project: CornMkt04 Corn Marketing 2004		Quantity	66,457.95	56,544.54	9,913.41
CS1000 - CornMkt04 -CS1000 Corn		Cost/Unit	1.59	1.59	1.59
	Production	Total	Remaining	Sold	
Quantity	66,457.95	66,457.95	56,544.54	9,913.41	
Acres	483.70	483.70	0.00	483.70	
Seed	0.22	0.00	0.22	0.22	
Chemicals	0.13	0.00	0.13	0.13	
Fertilizer	0.21	0.00	0.21	0.21	
Fuel	0.00	0.00	0.00	0.00	
Custom Hire	0.00	0.00	0.00	0.00	
Custom Hire	0.00	0.00	0.00	0.00	
Crop Production	0.26	0.00	0.26	0.26	
Crop Harvesting	0.15	0.00	0.15	0.15	
Crop Processing	0.00	0.18	0.18	0.18	
Farm General	0.16	0.00	0.16	0.16	
Farm Site	0.20	0.00	0.20	0.20	
Cash Rent	0.00	0.00	0.00	0.00	
Commercial Drying	0.00	0.00	0.00	0.00	
Storage	0.00	0.00	0.00	0.00	
Insurance	0.07	0.00	0.07	0.07	
Crop Purchases	0.00	0.00	0.00	0.00	
Sales Reducer	0.00	0.00	0.00	0.00	
Total Dollars	93,602.09	11,962.43	89,817.66	15,746.86	
Dollars/Unit	1.41	0.18	1.59	1.59	
Dollars/Acre	193.51	24.73	89,817.66	32.56	

Compare with \$1.76

Figure 45. Corn Marketing Center 2004

Note the differences in revenue, costs and net income from Figure 46.

	ACTUAL VALUE	% of TOTAL	ACTUAL PER BU	
REVENUE				
Crop Sales	159,203.44	96.79	2.24	
Government Payment	5,271.51	3.21	0.07	Only includes LDPs
Total REVENUE	164,474.95	100.00	2.32	
PRODUCTION EXPENSES	Compare with \$185,845.95 in Scenario 1			
Production Stage	93,602.09	84.93	1.41	
Inventory Adjustment	16,606.43	15.07		
Total PRODUCTION EXPENSES	110,208.52	100.00	1.55	
SUPPORT COST CENTERS				
Corn Processing	5,177.79	92.69	0.07	
Storage	408.27	7.31	0.01	
Total SUPPORT COST CENTERS	5,586.06	100.00	0.08	
COST OF GOODS SOLD	115,794.58		1.63	Compare with \$1.66 in Scenario 1
PRODUCTION MARGIN	48,680.37		0.69	
SALES & GENERAL				
Sales & Marketing	1,941.58	26.13	0.03	
G&A	5,489.33	73.87	0.08	
Total SALES & GENERAL	7,430.91	100.00	0.10	
OPERATING MARGIN	41,249.46		0.58	
OTHER EXPENSE				
Interest Expense	7,729.69	100.00	0.11	
Total OTHER EXPENSE	7,729.69	100.00	0.11	
TOTAL EXPENSE	130,955.17		1.85	
NET INCOME BEFORE TAX	33,519.78		0.47	Compare with \$54,185.68 in Scenario 1

Figure 46. Corn Profit Center Report

Net income has been reduced by \$19,222.51 from Figure 47.

Description	Current Period	Period % of Tot.	Current YTD	YTD % of Tot.
INCOME				
Crop Sales	279,171.72	90.52	279,171.72	90.52
Inventory Adjustment	-8,554.95	-3.46	-8,554.95	-3.46
Government Payment	30,907.26	10.02	30,907.26	10.02
Other Revenue	5,001.00	1.62	5,001.00	1.62
Patronage Dividend	1,880.00	0.61	1,880.00	0.61
TOTAL INCOME	308,405.03		308,405.03	
PRODUCTION EXPENSES				
Chemicals	13,386.25	5.42	13,386.25	5.42
Custom Hire	1,624.35	0.66	1,624.35	0.66
Depreciation Prod.	30,830.04	12.49	30,830.04	12.49
Fertilizer & Lime	14,111.20	5.72	14,111.20	5.72
Fuel, Oil, Gas & LP Prod	15,569.04	6.31	15,569.04	6.31
Insurance Prod	11,982.20	4.85	11,982.20	4.85
Labor & Management Prod.	20,400.00	8.26	20,400.00	8.26
Miscellaneous	10,437.83	4.23	10,437.83	4.23
Rent & Lease Production	44,244.00	17.92	44,244.00	17.92
Repairs & Maint. Prod.	18,939.92	7.67	18,939.92	7.67
Seeds & Plants	25,901.08	10.49	25,901.08	10.49
Supplies Prod	233.23	0.09	233.23	0.09
Taxes & Licenses Prod.	5,492.46	2.22	5,492.46	2.22
Utilities Production	581.05	0.24	581.05	0.24
Total PRODUCTION EXPENSES	213,732.65	86.57	213,732.65	86.57
COST OF GOODS SOLD	213,732.65	86.57	213,732.65	86.57
PRODUCTION MARGIN	94,672.38	38.34	94,672.38	38.34
OPERATING EXPENSES				
Sales & Marketing	1,342.73	0.54	1,342.73	0.54
Insurance G&A	3,604.12	1.46	3,604.12	1.46
Fuel, Oil, Gas & LP G&A	1,045.12	0.42	1,045.12	0.42
Labor & Management G&A	3,600.00	1.46	3,600.00	1.46
Supplies G&A	434.95	0.18	434.95	0.18
Taxes & Licenses G&A	2,878.00	1.17	2,878.00	1.17
Repairs & Maint. G&A	1,462.98	0.59	1,462.98	0.59
Utilities G&A	3,416.35	1.38	3,416.35	1.38
Total OPERATING EXPENSES	17,784.25	7.20	17,784.25	7.20
OPERATING MARGIN	76,888.13	31.14	76,888.13	31.14
FINANCING EXPENSES				
Interest Expense	15,387.09	6.23	15,387.09	6.23
Total FINANCING EXPENSES	15,387.09	6.23	15,387.09	6.23
NF INCOME FR OPERATIONS	61,501.04	24.91	61,501.04	24.91
NET INCOME B/F TAXES	61,501.04	24.91	61,501.04	24.91

Figure 47. Entity Income Statement

Both finished goods inventories and net income have been reduced by \$19,222.51 from Figure 48.

Description	12/31/2004	Description	12/31/2004
CURRENT ASSETS		CURRENT LIABILITIES	
Checking Accounts	54,358.44	A/man Interst	8,211.00
Accounts Receivable	107.53	A/man Property Taxes	7,720.00
Total CURRENT ASSETS	54,465.97	Operating Loans	14,455.00
		Total CURRENT LIABILITIES	30,386.00
INVENTORY		LONG TERM LIAB	
INV Crop Growing	22,627.99	Notes Payable	76,110.12
INV Crop Harv/Store	155,579.44	NP Real Estate	129,197.04
INV Chemicals	102.16	Deferred Taxes	111,761.00
Total INVENTORY	178,309.59	Total LONG TERM LIAB	317,068.16
LONG TERM ASSETS		TOTAL LIABILITIES	347,454.16
Building&Improvements	11,754.30	EQUITY	
Machinery & Equip	376,645.13	Contrib Capital	276,808.20
A/D Mach & equip	-61,660.08	Inventory Adjustment	-606.03
Total LONG TERM ASSETS	326,739.35	Current Year NI	61,501.04
		Retained Earnings	440,088.40
INVESTMENTS		Valuation Equity	221,796.31
Other Investments	52,977.17	Total EQUITY	999,587.92
Real Estate	734,550.00		
Total INVESTMENTS	787,527.17		
TOTAL ASSETS	1,347,042.08	LIABILITIES + OWNER EQUITY	1,347,042.08

Figure 48. Entity Balance Sheet

Scenario #2 usually maintains a lower inventory cost.

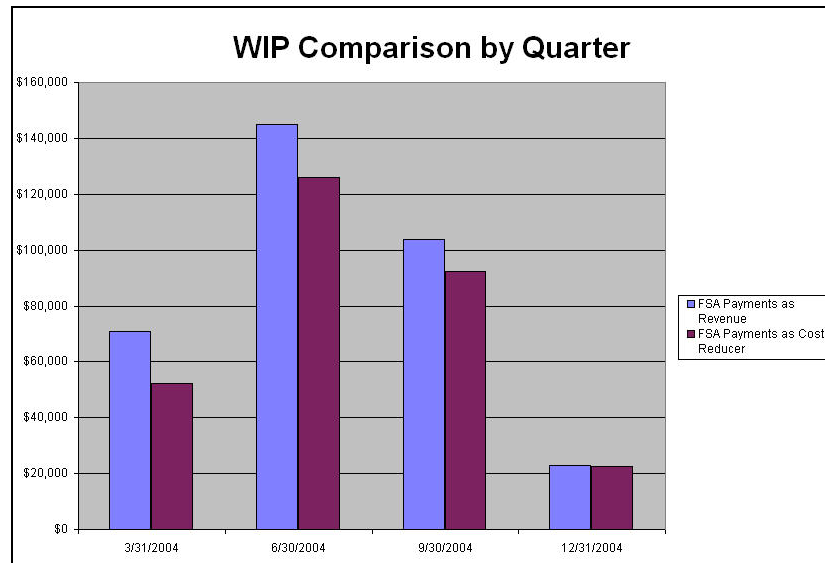


Figure 49. Comparison of Work-In-Process Inventories between the Two Scenarios

Scenario #2 usually maintains a lower inventory cost.

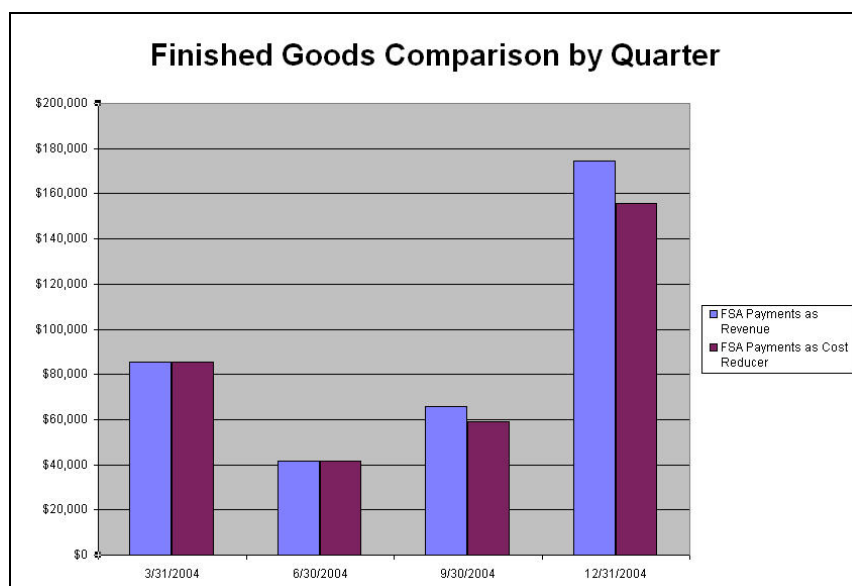


Figure 50. Comparison of Finished Goods Inventories between the Two Scenarios

Note that more income is deferred to 2005 with Scenario #2. When the 2004 crop is finally sold, the net income is equal for both scenarios.

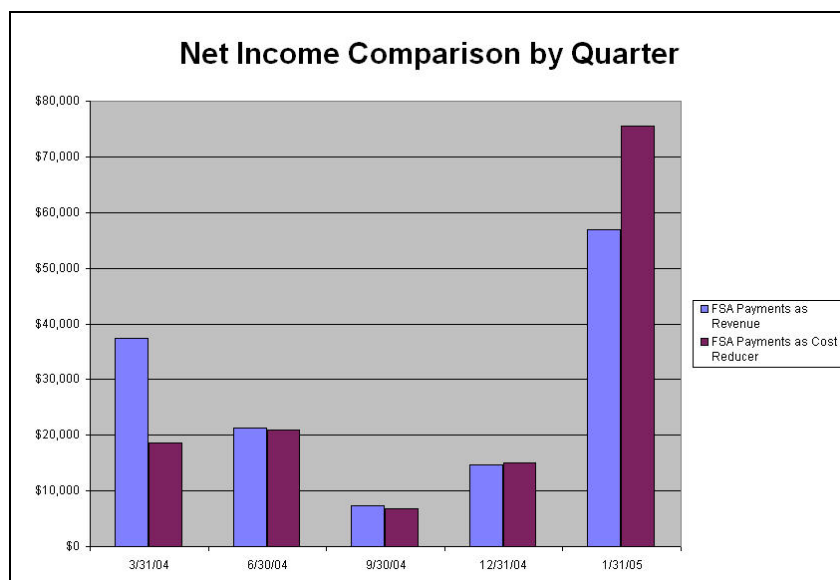


Figure 51. Comparison of Net Income between the Two Scenarios

Production costs are consistently lower under the FSA Payment as Cost Reducer scenario.

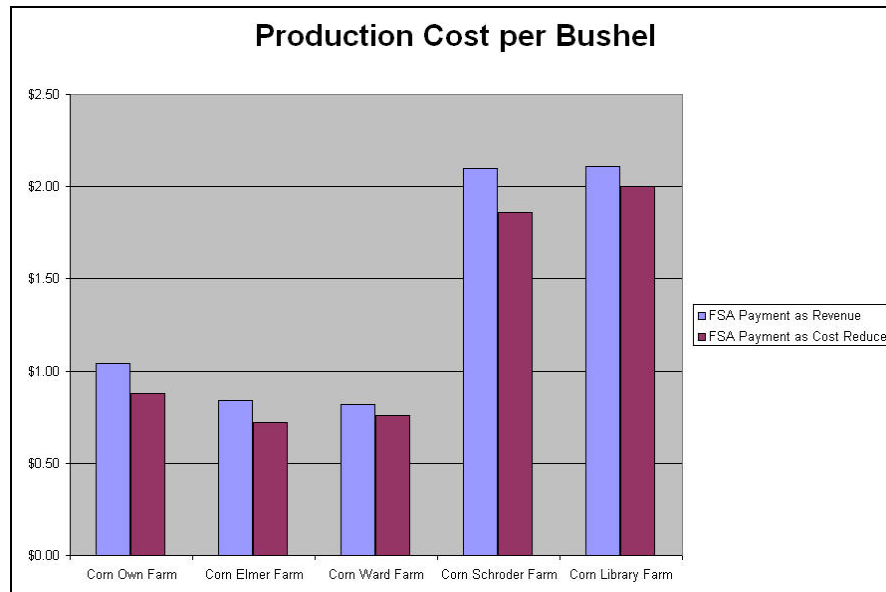


Figure 52. 2004 Corn Production Cost Comparison between Farms and Scenarios

Production costs are consistently lower under the FSA Payment as Cost Reducer Scenario 3.

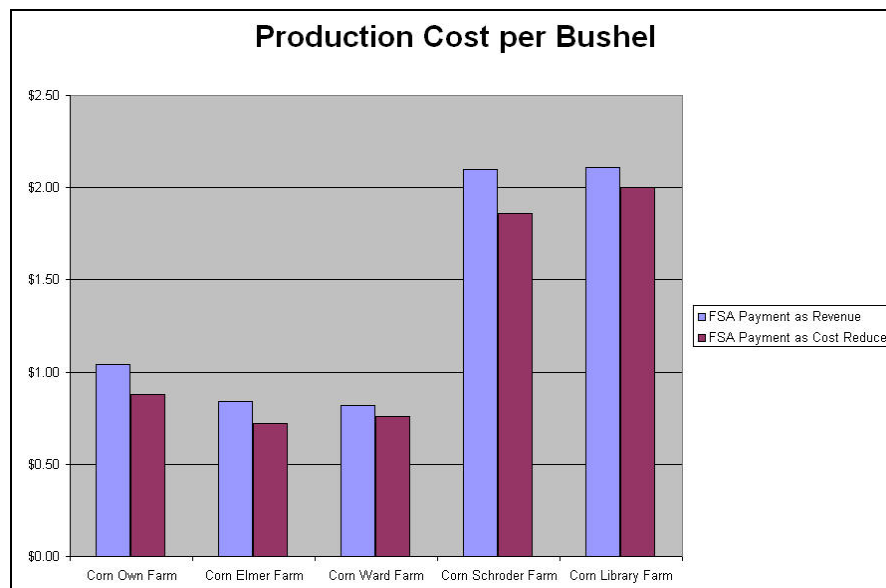


Figure 53. 2004 Corn Production Cost Comparison between Farms and Scenarios

Production costs are consistently lower under the FSA Payment as Cost Reducer scenario.

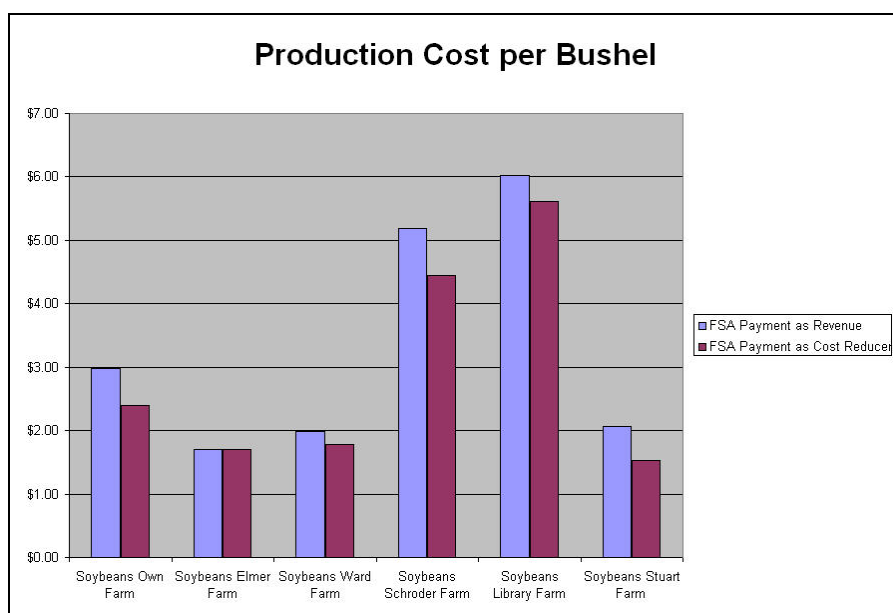
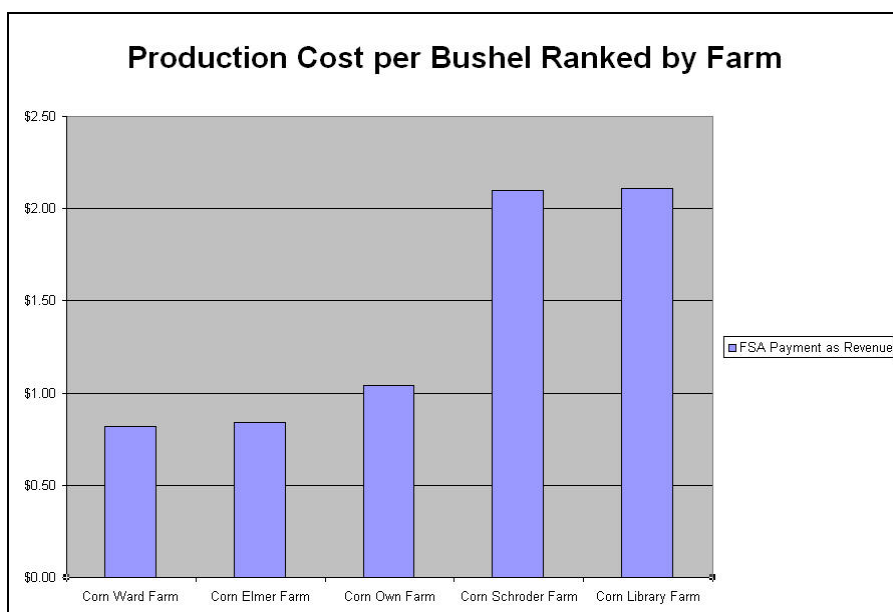
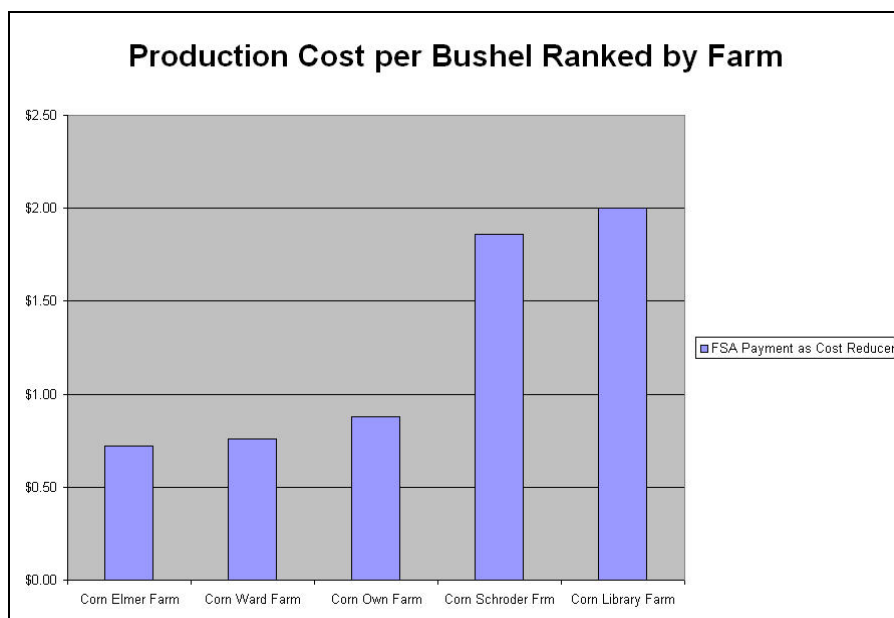


Figure 54. 2004 Soybean Production Cost Comparison between Farms and Scenarios

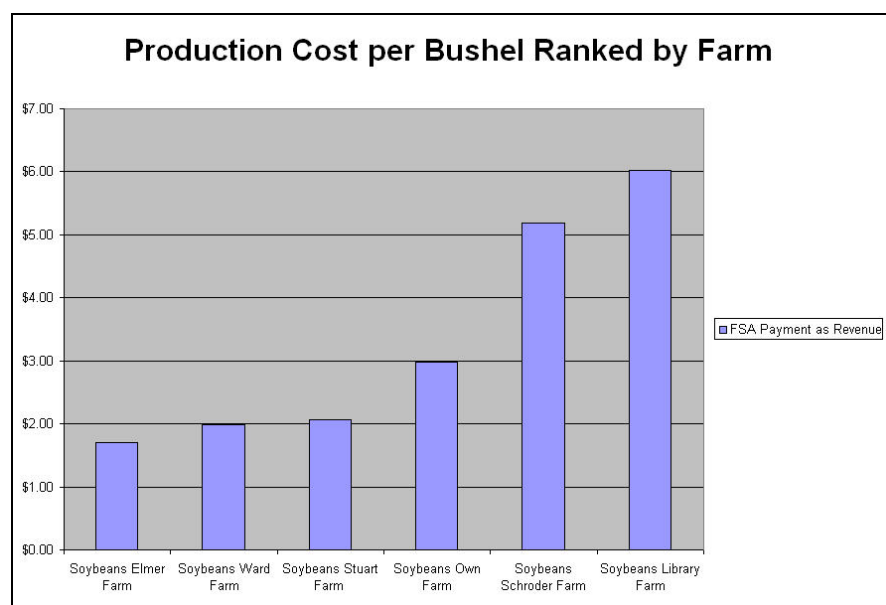


**Figure 55. 2004 Corn Production Costs Ranked by Farm
(Scenario #1—FSA Payments as Revenue)**

Note that only Elmer and Ward have changed positions.

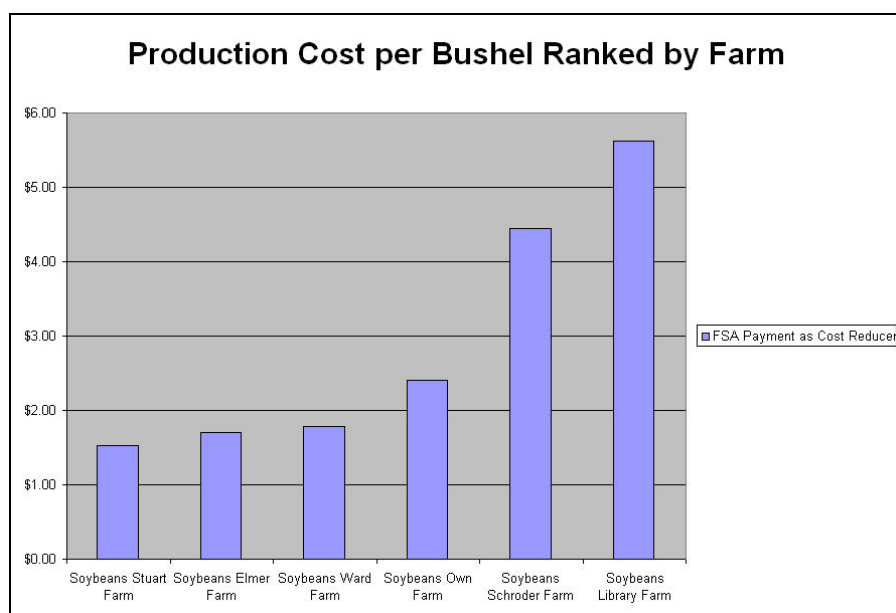


**Figure 56. 2004 Corn Production Costs Ranked by Farm
(Scenario #2—FSA Payments as Cost Reducer)**



**Figure 57. 2004 Soybean Production Costs Ranked by Farm
(Scenario #1—FSA Payments as Revenue)**

Note that Stuart, Elmer and Ward have changed positions.



**Figure 58. 2004 Soybean Production Costs Ranked by Farm
(Scenario #2—FSA payments as Cost Reducer)**

