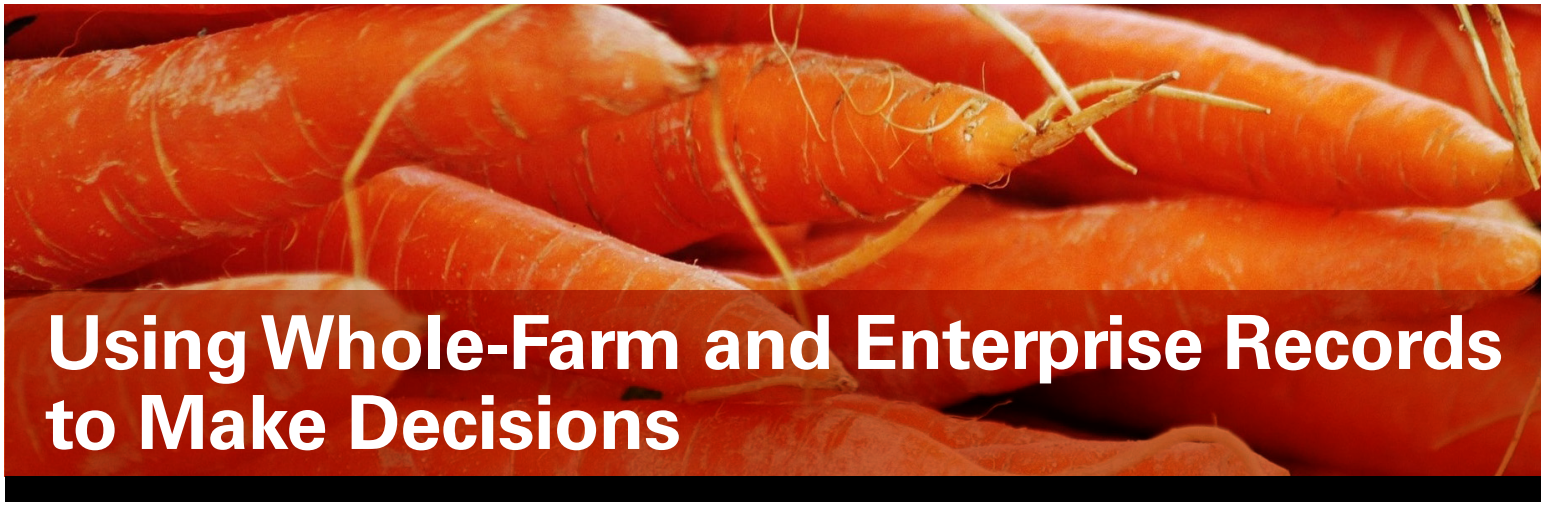


Using Whole-Farm and Enterprise Records to Make Decisions

The ultimate goal of using any recordkeeping system is to help make better management decisions. In particular, farm records should allow the owners to compare their operation to others, or to its own history. Secondly, farm records should allow the owners to plan and evaluate proposed projects. For example, if several projects are proposed, each should be evaluated on how it would affect the current financial condition of the farming operation. Lastly, owners should understand how to interpret financial and enterprise records in order to determine when the farming operation strays off course. With good financial information, owners will be able to determine how the farming operation got off course and develop a corrective course of action.

Whole-Farm Analysis

Recordkeeping systems should consist of a series of financial statements that provide an overview of the whole farming operation, along with enterprise (or production) records that focus on the particular components of the farming operation. Most whole-farm financial statement analyses are derived from a balance sheet (or net worth statement) and an income statement.

Five key measures of financial performance are commonly analyzed: liquidity, solvency, profitability, financial efficiency, and repayment capacity (see Plastina, 2019, for a detailed look at financial measures). Together, these criteria measure both financial condition and performance, allowing the owner, as well as a lender or other outside reader, to better understand how well the business is currently doing.

Example Farm

An example farm can be used to illustrate how financial ratios and enterprise records are used for decision-making. The example farm produces vegetables on five acres in central Iowa. A total of 15 different vegetables are produced, but the owner focuses on the four vegetables customers associate with the farm: heirloom tomatoes, carrots, sweet potatoes, and snow peas. The farm channels products through a variety of institutional and farmers markets. See excerpts from the farm's balance sheet and income statement in Table 1.

Table 1. Balance Sheet and Income Statement Highlights

Financial Measures 12/31/2019			
BALANCE SHEET		INCOME STATEMENT	
Current assets	8,500	Gross revenue	60,000
Current liabilities	4,200	Operating expense	16,250
Total assets	70,000	Labor (paid)	12,500
Total liabilities	42,000	Interest expense	3.750
		Depreciation expense	2,000
		Net farm income	25,500

Whole-Farm Ratios

Plastina (2019) describes 14 financial measures. This publication will focus on six of those ratios. The first is the **current ratio** (current assets ÷ current liabilities), which measures the farming operation's ability to meet its short-term financial obligations. The example farm's current ratio is 2.02 (8,500 ÷ 4,200), which normally indicates a farm that can easily pay off its short-term debt with cash and other current assets that can be converted to cash.

The second ratio is the **debt-to-asset ratio** (total liabilities ÷ total assets), which measures how much of the farm's assets are financed and how much are owned outright. The debt-to-asset ratio for the example farm is .60 (or 60%), indicating that 60% of the farm's assets would have to be sold to pay off all debt obligations. This number is high compared to most agricultural industry benchmarks. Most lenders would like the debt-to-asset ratio to be below .50 and approach .40. The example farm may have a high debt-to-asset ratio because it recently purchased land or equipment with a relatively small down-payment.

Net farm income is critical to pay off debt and provide dollars to cover family living expenses such as medical and other home operating expenses. However, net farm income is a difficult measure to benchmark and compare, as it is often directly related to the size of the farming operation. So instead, this publication will focus on two other profitability measures: rate of return on farm assets, and operating profit margin.

Rate of return on farm assets is a more complicated measure and takes into consideration the value of unpaid labor (see Plastina 2019 for specific formulas). To calculate rate of return, use the numbers in Table 1 in addition to the dollar amount of unpaid labor provided by the owner/operator.

For this example, assume the owner/operator provided $20,000 in unpaid labor. The rate of return on farm assets for this example would be 13.2% (25,500 + 3,750 – 20,000 = 9,250 ÷ 70,000 = 13.2), which is higher than a typical commodity agricultural enterprise. However, without comparable benchmarks from other vegetable growers, it is difficult to determine whether this farm is efficiently using its assets for vegetable production.

An alternative evaluation would compare the rate of return on farm assets to other returns that could be earned if the farm assets were sold for current value (in this case $70,000) and invested in a variety of markets. The 13.2% return is clearly above low-risk alternatives such as certificates of deposit and money-market funds, and in many cases above mid-risk alternatives such as blue-chip stock indexes.

Businesses can increase profitability using two primary methods. The first is to increase the profit received per unit while maintaining the number of units produced. The second is to maintain the profit received per unit and increase the number of units produced.

The **operating profit margin** focuses primarily on the former, whereas the **asset turnover ratio** focuses primarily on the latter. The two measures multiplied together result in the **rate of return on farm assets**. The operating profit margin for the example farm is 15.4% (9,250 ÷ 60,000).

The last two financial indicators measure the financial efficiency of the farming operation. The asset turnover ratio indicates how efficiently the business uses its assets to generate revenue. The asset turnover ratio for this farm is .86 or 86% (60,000 value of farm production ÷ 70,000 in assets). This figure is much higher than typical commodity agricultural enterprises, which have a larger asset base to develop revenues.

The last measure is the **operating expense ratio**, which indicates the percentage of gross revenue used to cover operating expenses of the business. Gross revenue needs to cover operating expenses, depreciation, and interest, with some left over for net income.

The operating expense ratio for the example vegetable farm is 27% (16,250 ÷ 60,000), which is low compared to commodity agricultural enterprises. However, keep in mind that vegetable production is highly labor-intensive and unpaid operator labor is not included in operating expenses. If the unpaid operator labor of $20,000 had been included in operating expenses, then the operating expense ratio would have been 60%, which is a more common result in agriculture.

Limitations of Whole-Farm Measures

Financial measures have several limitations. First, they do not give answers to problems. Rather, they point to potential problems that need to be addressed by management. It is easier to determine potential problem areas when industry benchmarks are available, as is the case with commodity agriculture. Without these industry benchmarks, problem areas may be illustrated when the owner measures a set of financial benchmarks over time. Growth in liquidation, solvency, or income measurements should be viewed as positive.

Second, the interaction among financial measures should be analyzed in addition to the individual measures themselves. A combination of measures may lead to different conclusions than looking at one measure by itself.

For example, let's assume two farms have a rate of return on farm assets of 12%. Farm A has an operating profit margin of 40% and an asset turnover ratio of 30%. Farm B has an operating profit margin of 15% and a turnover ratio of 80%. Let's further assume that the two farms are the same size and have the same labor costs.

If you were the financial consultant for each farm, would your recommendation be the same for each farm even though the rate of return on farm assets is the same? The answer is no. Farm A needs to look at ways to increase production while maintaining profit per unit, whereas Farm B needs to determine if it can produce units with a higher profit margin per unit.

Third, the financial condition and performance measures are only as good as the data used to calculate them. The standard saying "garbage in, garbage out" applies here. Any management decisions based on inaccurate or incomplete financial information can lead the business down the wrong path. Fourth, the results of the financial analysis are a means toward an end, not the end in itself.

For example, a farming operation may have several options available to explore. Even though one of the options may be the "best" financially, it may not fit with the business or personal goals of the owner.

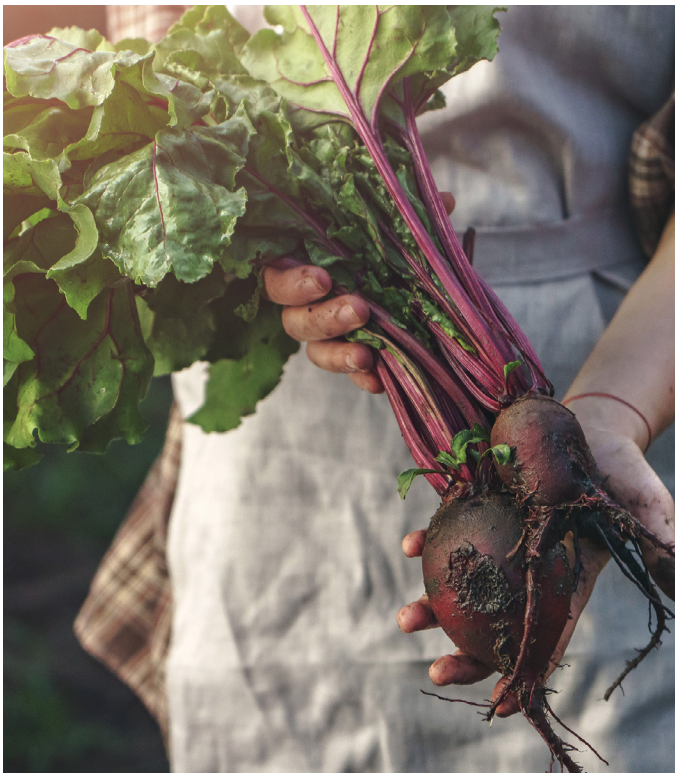
Enterprise Analysis

An **enterprise budget** is an estimate of the costs and returns to produce a product (enterprise). For example, an Iowa corn and soybean producer would be interested in developing both corn and soybean enterprise budgets. Farmers who grow or raise a large variety of products may wish to develop budgets only for their key products (those products they believe contribute the most to attaining their goals).

Types of Decisions

An enterprise budget can help with a variety of business decisions. In this publication we will focus on three: pricing, changing production practices, and product mix.

Pricing products is difficult but can be based on one of three approaches: customer-based, competition-based, or cost-based. Although no single pricing strategy works without the consideration of the other two, pricing a product without knowing its true cost of production could lead to business failure. Therefore, it makes sense to start with costs and then consider both the customers and the competition.



Enterprise budgets can be compared to other producers' costs or industry averages to determine if the individual farm's costs are high or low in comparison. If costs are high, then the budget will point to specific areas that need further analysis. Budgets also indicate where key costs occur. If key cost items appear too high, the producer should change production practices to lower per-unit costs.

Enterprise budgets should be developed and compared for each product that contributes significantly to annual returns or other business goals. The budgets will indicate how land, labor, and capital are being used for each enterprise, and an appropriate mix of enterprises can be developed to meet business goals. If a new enterprise is being considered, then a budget can be developed while the product is being produced on a small scale. If the new enterprise compares favorably, then it can be added to the existing product mix.

The case farm for this publication raises a variety of vegetables including carrots. Let's assume production records are kept on carrots similar to Chase and Hanlon (2020), and total costs per bed were determined to be $121.59. Cost per pound of carrots sold was $.81. Producers should use the $.81 per pound figure to compare to other producers to determine if their individual costs are higher or lower. If costs are higher, then the budget should be evaluated in detail to determine where costs differ and why.

A second reason for a detailed analysis of the budget is that it allows the producer to determine where key costs occur. For the carrot example, $80.39 (66%) of the total cost of $121.59 is in the labor activities. For this key expense, the producer can reevaluate labor requirements to determine if changes can be made to make labor more efficient. If the same yield can be maintained with less labor, costs per unit should decrease.

In the same way, small expenses such as supplies ($16.06 per bed or 13% of the total) don't need to be analyzed in as much detail, because a 10-20% reduction in supplies will not affect the total production costs significantly.

Limitations of Benchmarking

As is the case with whole-farm records, the ability to benchmark to other producers is solely based on the availability or access to summaries of enterprise records. If benchmarking to industry standards is not possible, a producer should keep enterprise records over time to see how costs change. The producer also can evaluate changes in production practices to determine if efficiencies can be gained.

One of the limitations of benchmarking to other businesses or industry standards is that formulas for benchmarking measurements may differ from one business to the next. For example, let's assume Farm A has gross income from farming operations of $250,000 and total farm assets of $300,000. The asset turnover ratio for this farm would be .83 ($250,000 ÷ $300,000). Farm B calculates asset turnover ratio as value of farm production divided by farm assets.

Value of farm production is calculated as gross income minus feeder livestock purchases and/or value of purchased feed. If Farm B purchases any feeder livestock or feed, then the value of farm production will be less than gross income. If the value of farm production for Farm B is $120,000, then the asset turnover ratio is .40 ($120,000 ÷ $300,000).

The problem arises when comparing a ratio using the second formula to a benchmark using the first. The initial impression for Farm B would be that the asset turnover ratio was 50% of the benchmark, indicating the need to make dramatic, immediate changes such as firing existing labor, liquidating enterprises, or other actions to obtain a competitive asset turnover ratio. The bottom line is that none of the benchmarks are better or worse than the others. Rather, they simply point out the importance of fully understanding the formulas behind the benchmarks before deciding on possible courses of action.

The same is true for general financial guidelines used by agricultural lenders or other credit sources. The calculation of financial measures may differ as well as assigning results into broad categories of good, average, and poor. So, prior to using guidelines like those presented in Table 2, understand fully the formulas used for the measurement calculations.

Table 2. General Financial Guidelines

FINANCIAL	GUIDELINES		
Measure	Good	Average	Poor
Current ratio	> 1.5	1.0 - 1.5	< 1.0
Debt-to-asset ratio	< .30	.30 - .60	> .60
Return on assets	> .10	.05 - .10	< .05
Operating profit margin	>.15	.05 - .15	<.05
Operating expense ratio	< .65	.65 - .80	>.80
Asset turnover	>.40	.25 - .40	< .25

Assuming the case farm calculates measurements the same way, how does our example farm match up? The current ratio of 2.02 is good, whereas the debt-to-asset ratio of .60 is borderline poor. The return on assets of .132 and operating profit margin of .152 are both classified as good. The operating expense ratio of .27 and asset turnover of .86 also are classified as good.

Keep in mind that the financial guidelines generally are used for benchmarking larger-scale commodity agriculture operations. This could warrant a discussion with your lender about appropriate measures for a smaller-scale vegetable farm or other alternative enterprise.

As pointed out earlier, comparing the business's financial performance to other businesses within the industry or to industry benchmarks may be misleading unless the ratios or performance measures are calculated in exactly the same manner. If the farming operation calculates asset turnover based on value of farm production and compares the result to an industry benchmark of asset turnover using gross revenues in the equation, the manager would get the wrong impression that his farming operation's asset turnover ratio is much below the industry standard.

The opposite could also occur, where the manager could get the mistaken impression their farming operation is doing much better than the industry standard. Bottom line is to compare an existing operation to an industry benchmark: the two formulas must be identical. Otherwise, an operator may develop the wrong impression and implement the wrong course of action.

Other potential flaws in comparing the business to other businesses include the timing of the income statement and balance sheet. This is particularly critical with businesses that have seasonal production and income streams.

Another challenge in comparing income statements is making sure both statements were prepared on either a pre- or after-tax basis. Another concern is whether the balance sheets were prepared on a market or cost basis. A balance sheet prepared on a cost basis may give substantially different results than one prepared on a market basis.

Another consideration is whether the balance sheets included only farming information or non-farm and personal items as well. Many other inconsistencies can occur between the business financial statements and those within the industry.

Making Better Decisions

Producers should maintain whole-farm and enterprise records in order to make better decisions. Enterprise records allow the owner of a business to analyze how efficiently the enterprise is operating and point to areas where enterprise profitability could improve. Enterprise records by their very nature are tied to production units.

As mentioned previously, operating profit margin, asset turnover ratio, rate of return on farm assets, and operating expense ratio all include gross revenue, net farm income, or other income statement components in their formulas. Therefore if producers wish to increase operating profit margin, for example, they should look at their enterprise budgets to determine where profits per unit produced could be increased. Could they increase planting rates or change weed management techniques to increase yields or reduce labor requirements?

With a better understanding of how the various measurements are determined, producers should be able to see how a change in pricing, production practices, or product mix would affect not only the enterprise, but the overall financial performance of the farm. Agricultural lenders and others use these overall farming measures to judge how the business is doing overall.

For example, assume that all of the overall financial measures are satisfactory except for debt-to-asset ratio. Because debt is typically paid off through profits or returns on the assets owned, profitability should be examined – in particular, rate of return on farm assets. Remember that rate of return on farm assets has two components: operating profit margin and asset turnover ratio.

Let's assume that the farm is similar to Farm A, with an operating profit margin of .40 and turnover ratio of .30. The operating profit margin is excellent, so it's unlikely the farm can increase rate of return on farm assets through increasing profit per unit. The turnover ratio of .30 is average and should be viewed as the better opportunity to increase returns. These are the types of questions producers should ask themselves in this situation:

- How can Farm A increase production while maintaining profit per unit?
- Is production limited or constrained by a scarce resource such as labor?
- Can the farmer use labor-saving devices or increase planting patterns to increase production?
- If labor is not constrained and machinery is available, is land the constrained resource?
- Is the business over-capitalized (through debt) for the given size of operation?
- Is it possible to increase the scale of the operation and sell more products?

Using our previous example, let's assume instead that we are Farm B, with an operating profit margin of .15 and a turnover ratio of .80. In this case, increases in revenues are unlikely to come from increases in units produced. Instead, focus on profits generated per unit produced.

- Is the right mix of products being produced?
- Is the farm producing only low-margin products or can higher-margin products be introduced into the product mix and sold?
- What marketing outlets are being implemented for all products?
- Is the operation focusing on low-margin marketing outlets such as institutional buyers or wholesalers?

The problem with Farm B may not be one of production, but rather of pricing and marketing its products.

Overall farm financial measures are important, but they tell producers only half the story. If an overall financial measure indicates a change should be made in the farming operation, how will that change be determined? Enterprise records are tied to production units and allow a better understanding of how changes in production practices, product mix, or pricing can affect not only the enterprise, but the overall farming operation.

Acknowledgements

Written by Craig Chase, program manager, ISU Extension and Outreach Farm, Food and Enterprise Development Program.

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