

Assessing and Improving Farm Profitability

Is my farm making money? This is a question farm managers think about often. To stay in business, the farm must generate a profit, at least in the long run. One of several important management tasks for farm managers, therefore, is assessing and improving farm profitability. This fact sheet explains profit and profitability and discusses ideas for improving farm performance. It also discusses the use of an income statement in analyzing profit and profitability.

What is Profit?

A farm that grows 500 acres of corn would generate income from the corn. To calculate profit, you normally subtract the operating costs of seed, fertilizer, pesticides, fuel, interest, hired labor, others, from the year's income. Growing corn also requires machinery and sometimes buildings, which add to the costs of the farm. But since these items last for several years, you do not subtract the entire cost for use of equipment and buildings the year they are purchased. Instead, you depreciate their value; that is, you prorate their cost over the useful life of the machinery and buildings so you charge only part of the cost against each year's income. When you subtract operating costs and depreciation from the annual farm income, the result is commonly called net farm profit.

Common definition of profit:

	Income
minus	Operating costs
minus	Depreciation
	<hr/>
equals	Net farm profit

There are other costs associated with your farmland, labor and management that ought to be considered. You could be renting your land to someone else to generate income. Also, you should put a value on your personal labor and management since you could be earning income from an off-farm job on the side or if you were not managing a farm. These alternative values for land, labor and management are called opportunity costs or the income that you could be receiving by investing these resources in the next best alternative use.

What Is Profitability?

You relate profit to opportunity costs through the concept of profitability. "Profit" and "Profitability" are not the same. When discussing profitability, you consider the relationship of net farm profit to your farmland, and the labor and management skills you invest in the farm business. For example, if your

farm generated a net farm profit of \$40,000 last year, what does this say about your farm's performance? To many smaller farms with a single owner or operator, a net income of \$40,000 might be considered a good profit, but to larger farms with more than one owner or operator, \$40,000 might be a poor showing for the year.

When comparing different sizes and types of farms to assess your farm's performance, you use profitability measurements such as: operator labor and management earnings, rate of return on equity or net worth, and rate of return on investment.

Operator Labor and Management Earnings

Most farmers own at least part of the resources they use in the farm business. The farmer's share is referred to as equity or net worth (see Fact Sheet 540, Assessing and Improving Farm Solvency, for more details about equity or net worth). A mistake is often made in concluding that net farm profit is the return to operator labor and management without considering a return to this equity or net worth. To find the true operator labor and management earnings, subtract first a reasonable amount as a return on the equity or net worth.

		Net farm profit
minus		Return on equity
equals		Operator labor and management earnings

In this calculation, how should the return on equity be valued? Consider the interest that you could generate if your equity were invested elsewhere. A minimum interest rate that is commonly used is 6 percent. To illustrate, take the case of the Whitmer family., The Whitmers have an equity of \$210,000 invested in the farm and generated a profit of \$40,000 the past year. Using the minimum 6 percent interest rate as the return on equity, the operator labor and management earnings would be:

		\$40,000 (net farm profit)
minus		12,600 (6 percent x \$210,000)
equals		\$27,400 (operator labor and management earnings)

Rate of Return on Equity

Rate of return on equity is another important measure of your farm's profitability. What rate of return is the Whitmer farm making on the equity in the business? In calculating the operator labor and management earnings, the Whitmers have made an assumption based on a 6 percent rate of return. However, they could similarly assume a value for operator labor and management and then calculate the rate of return on equity.

		Net farm profit
minus		Value of operator labor and management
divide by		Net worth
times		100
equals		Rate of return on equity

In this calculation, how should labor and management be valued? Family living expense may be a reasonable value. Some suggest an estimate of the wage or salary that a farmer could be receiving from a fulltime job off the farm. Another commonly used figure is \$5 per hour plus 5 percent of the value of farm production. Suppose the Whitmer farm, in our example, generates \$130,000 in value of farm production of which \$40,000 is net farm profit. The owner works 2,500 hours per year on the farm. The rate of return on equity could be calculated as follows:

	\$40,000 profit
minus	\$19,000 value of operator labor and management (2,500 hr x \$5/hr + \$130,000 value of production x 5 percent)
equals	\$21,000 return on equity
divide by	\$210,000 equity
equals	.10
times	100
<hr/>	
equals	10 percent rate of return on equity

This situation shows lower operator labor and management earnings and a higher rate of return on equity. Keep in mind that the returns are subjectively allocated to different resources. *Overvaluing one resource will understate the return to other resources.*

After calculating operator labor and management earnings and rate of return on equity you might ask, "How does my farm measure up?" Your best measurement guide is to compare these figures to what you think your labor and management are worth and the return you could get on your equity elsewhere.

Rate of Return on Investment

To a farmer who has considerable debt or is considering changes in the business and will need to borrow money, the rate of return on investment is important. Unlike the return on equity, which only looks at the owner's share of the business, the rate of return on investment indicates the return on the entire farm investment, including the debt-financed portion.

	Net farm profit
plus	Interest paid
minus	Value of operator labor and management
divide by	Total farm investment
times	100
<hr/>	
equals	Rate of return on investment

The rate of return on investment should be higher than the interest rate paid on debt. If so, the investment is earning enough to pay the interest with some left over for business growth. This measurement becomes more important as the level of farm debt increases. As the business approaches 100 percent debt financing, the farm must earn a rate of return at least equal to the debt interest rate or it will not be able to meet interest expenses and farm equity may decline. The following example illustrates this concept.

The Whitmers and the Cowderys have each invested \$350,000. Each family pays the same 10 percent interest rate (Table 1). However, the Whitmer farm is 40 percent in debt while the Cowdery farm is 80 percent in debt. Table 1 illustrates three different rates of return on farm investment.

In Case #2, the rate of return on investment is equal to the interest rate paid, so the rate of return on investment equals the rate of return on equity on both farms. In Case #3, with a 16 percent rate of return on investment, the Cowdery farm has an impressive rate of return on equity which reflects a higher farm business growth rate than the Whitmer farm. However, the Cowdery farm faces more risks for if the rate of return on investment decreases to 4 percent as in Case #1, it will have a negative rate of return on equity in comparison to the Whitmer Farm which has a 0 percent rate of return on equity.

How Can I Improve Farm Profitability?

Generating profits and increasing profitability are underlying concepts that should influence your decisions as a farm manager. Many things you do affect the level of profit. This, in turn, determines your standard of living and the growth potential of the farm business. A good farm manager should ask himself or herself the following questions often:

- Am I making the most profitable use of my land and building resources with crop and livestock enterprises I have chosen?
- Are my operating inputs at the optimal level?
- Is my equipment the proper size for my farm?
- Do I acquire the most favorable terms on borrowed money?
- Does my borrowed money earn a rate of return greater than the interest rate I pay?
- Are my field operations timely?
- Do I plan and carry out good marketing strategies?
- Do I make good use of my time and hired labor?
- Do I take advantage of new technologies?
- Are there custom field work or off-farm employment opportunities that could augment my farm income?
- Do I maintain good business relations with others?
- Do I manage my taxes to increase after tax income?
- Are my family living allowances reasonable?
- Am I allowing my farm operation to grow by putting back some of my profits into the business?

There is no one clear path to improving profits and profitability. Rather, *profitability is a state of mind in which a farm manager carefully controls every aspect of the operation to make the most profitable use of the resources available to the farm business.*

Table 1. Investment, debt, equity and profitability on Whitmer and Cowdery farms

	Whitmer Farm			Cowdery Farm		
	1	2	3	1	2	3
Total farm investment	\$350,000			\$350,000		
Total debt	\$140,000			\$280,000		
Equity or net worth	\$210,000			\$ 70,000		
Percent in debt	40			80		
Average interest rate paid	10%			10%		
	Case			Case		
Rate of return on investment	4%	10%	16%	4%	10%	16%
Return on investment	\$14,000	\$35,000	\$56,000	\$14,000	\$35,000	\$56,000
Interest paid	\$14,000	\$14,000	\$14,000	\$28,000	\$28,000	\$28,000
Return to equity	\$0	\$21,000	\$42,000	(\$14,000)	\$7,000	\$28,000
Rate of return on equity	0%	10%	20%	(20%)	10%	40%

What Is Enterprise Profitability?

We have discussed profits and profitability in relation to the whole farm. Since your farm is made up of crop and livestock enterprises, you must view each enterprise as a separate profit center so you can determine which enterprise contributes to the overall profitability of the farm and which one does not. You can then decide what to do with the less profitable enterprises.

Calculating profits for individual enterprises is similar to calculating profits for the entire farm, with one difference. In your calculations, you include only income and expenses pertaining to the individual enterprise. This process, called enterprise budgeting, is discussed in detail in Fact Sheet 542, *Enterprise Budgets in Farm Management Decision making*.

How Do I Use an Income Statement to Calculate Profit?

Good farm records are important tools in managing the farm business (see Fact Sheet 542, *Developing and Improving Your Farm Records*). To calculate your farm profits and assess your farm profitability, use your Income Statement, sometimes called *Profit-and-Loss Statement*.

Your income statement should cover a given accounting period, such as one year, and which often coincides with the calendar year. It summarizes income, expenses and profit for a farm operation. Two different accounting methods, cash and accrual, are used in preparing income statements. Most farmers use cash income statements to calculate income for tax purposes. With this method, you determine profit by using cash receipts, cash expenses and depreciation recorded during the accounting period. However, this method does not give an accurate picture of business profit or loss during the period. Accelerating or postponing sales and expenses from one accounting period to another can distort the profit. Overlooking inventory changes, capital sales and capital purchases may further misrepresent profit.

Accrual accounting adjustments to your cash Income statement solve this problem. By including inventory changes and capital adjustments in your income statement, you get a more accurate measure of profit. Table 2 illustrates an accrual income statement for the Whitmer farm. (This fact sheet includes

a blank accrual Vicorne statement form. See page 6.)

Cash farm income. In the cash farm income section of your income statement, list the sources and values of your cash farm income. include receipts from sales of crops, livestock, livestock products and government payments from commodity programs. Include also, income received for custom work, co-op patronage dividends, and other such items. The Whitmer farm in Table 2 generated \$134,410 income from corn, soybeans, hog sales and payments from participation in government commodity programs.

Cash operating expenses. Under cash operating expenses, include those associated with the operation of the farm business. In addition to variable production expenses such as feed, seed, fertilizer, short-term interest on operating capital, and supplies, include fixed cash expenses such as taxes, insurance and interest on intermediate and long-term loans. In the example on page 5, cash operating expenses are listed by category giving a total of \$97,170. Total cash operating expenses minus total cash income result in a net cash farm income of \$37,240.

Inventory changes. A problem arises when your inventories of crops, market livestock and other items are higher or lower at the end of the accounting period than at the beginning. Thus, you either understate or overstate your net cash farm income. The section on "Inventory Change" makes accrual adjustment to the cash income and expenses to solve this problem.

In the example, inventories of market livestock (hogs) are \$6,200 higher at the end of the period than at the beginning of the period. By subtracting the beginning inventory to exclude sales of market livestock from the previous year and adding an ending inventory which includes production for this year which has not been sold, the proper accrual adjustment is made to the net cash farm income. Other inventory categories are adjusted so items incurred during this period are included and those items incurred in the previous period are excluded. After all inventory changes are totaled, the example shows that inventories are \$6,350 higher at the end of the accounting period than they are in the beginning. This is added to the net cash farm income to get a net operating profit of \$43,590.

Depreciation and other capital adjustments. Your income statement should consider depreciation and other capital adjustments next. These adjustments are calculated by subtracting beginning inventories and capital purchases for each asset category from the ending inventories and capital sales. In the example, the value of these assets on the farm operation decreased \$7,400 in value from depreciation and change in inventory due to capital sales and purchases. After subtracting the \$7,400 from the net operating profit, the total profit on this farm for the accounting period is \$36,190.

Profitability. your accrual income statement should give a picture of business profit for the accounting period. However, the analysis is not complete at

Table 2. An accrual income statement for the Whitmer farm
Income Statement Name _____ Peroid covered _____ to _____

Cash Farm Income		Cash Operating Expenses			
Crop sales		Seed	7,100		
<i>CORN</i>	73,010	Fertilizer, lime, chemicals	25,800		
<i>JOYBEANS</i>	25,200	Livestock purchased for resale	3,750		
		Vet, medicine, breeding fees	250		
		Livestock marketing	500		
		Fuel, oil, lubricants	4,025		
		Utilities	1,740		
Livestock and livestock product sales	23,414	Repairs	2,740		
		Taxes, insurance	3,625		
		Hired labor	1,080		
		Rent, leases	13,500		
		Machine hire	10,500		
		Supplies	1,615		
		Interest	11,780		
Government payments	12,786	Other			
Other farm income					
Total cash farm income	134,410	Total cash operating expenses	97,170		
		Net cash farm income	37,240		
Inventory Changes					
	Crops & feed	Market livestock	Receivables & other income items	Supplies & prepaid expenses	Payables & accrued expenses
Ending inventory	14,500	14,000	6,700	2,200	Beg. 7,500
Beginning inventory	15,20	7,800	5,900	1,900	End. 7,750
Inventory change	(700)	6,200	800	300	(250)
Net operating profit					43,590

Depreciation and Other Capital Adjustments						
	Breeding livestock	Machinery & equipment	Buildings & improvements	Other	Land	
Ending inventory		64,800	62,400		190,000	
Capital sales		2,300	0		0	
Ending inventory & sales		67,100	62,400		190,000	
Beginning inventory		73,000	63,900		190,000	
Capital purchases		0	0		0	
Beg. invent. & purchases		73,000	63,900		190,000	
Deprec. & cap. adjustm.		(5,900)	(1,500)			(7,400)
Profit or Loss						36,190

Department of Agricultural & Resource Economics, University of Maryland at College Park

Income Statement Name _____ Peroid covered _____ to _____

Cash Farm Income		Cash Operating Expenses	
Crop sales		Seed	
		Fertilizer, lime, chemicals	
		Livestock purchased for resale	
		Vet, medicine, breeding fees	
		Livestock marketing	
		Fuel, oil, lubricants	
		Utilities	
Livestock and livestock product sales		Repairs	
		Taxes, insurance	
		Hired labor	
		Rent, leases	
		Machine hire	
		Supplies	
		Interest	
Government payments		Other	

Other farm income						
Total cash farm income			Total cash operating expenses			
			Net cash farm income			
Inventory Changes						
	Crops & feed	Market livestock	Receivables & other income items	Supplies & prepaid expenses	Payables & accrued expenses	
Ending inventory					Beg.	
Beginning inventory					End.	
Inventory change						
Net operating profit						
Depreciation and Other Capital Adjustments						
	Breeding livestock	Machinery & equipment	Buildings & improvements	Other	Land	
Ending inventory						
Capital sales						
Ending inventory & sales						
Beginning inventory						
Capital purchases						
Beg. invent. & purchases						
Deprec. & cap. adjustm.						
Profit or Loss						

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Table 3. Profitability measurements for the Whitmer farm

(A) Return to labor, management and net worth		\$36,190
Labor and management earnings	(A - B)	\$23,380
Rate of return on equity	(G / H)	7.9%
Rate of return on investment	(E / F)	8.1%
(B) Interest on farm net worth	(H x 6%)	\$12,810
(C) Farm interest		\$11,780
(D) Value of operators' labor and management	(\$5 x 2,500 Labor Hours + 5% x 1)	\$19,221
(E) Return to farm investment	(A + C - D)	\$28,750
(F) Total farm investment		\$353,900
(G) Return to farm net worth	(A - D)	\$16,970
(H) Farm net worth		\$213,500
(I) Value of farm production		\$134,410

this point. Profit should be related to the resources used in the business through profitability measurements discussed earlier in the fact sheet. Table 3 shows the profitability measures for the Whitmer farm. The profit (return on labor, management and net worth) of \$36,190 is listed first followed by the three profitability measurements. The formulas for calculating the measurements are also listed. The items starting with "(13) Interest on farm net worth" contain the information needed to calculate the profitability measures. The Whitmer farm was profitable the past year. It had positive labor and management earnings. Rates of return on equity and investment equaled or exceeded many alternative investment rates. Management on this farm should build on this positive financial position to maintain farm profitability well into the future.

What Computer Farm Management Programs Are Available?

The financial management of your farm can be complex and time consuming. You need time to spend gathering and organizing data to prepare income statements and calculate profitability figures. Microcomputers can help in the analysis of your farm operation. The Maryland Cooperative Extension Service offers farmers computer assistance through the FINPACK Farm Financial Planning and Analysis computer program. FINPACK was developed by the University of Minnesota. It does a complete financial analysis of your farm, and it has been used on over 40,000 farms in 40 states. The Financial Long Range Budgeting (FINLRB) and Financial Analysis (FINAN) components of this program provide a comprehensive profitability analysis of the farm operation. To find out more about this program, contact your Extension agent at your local county Extension office.

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