

enterprise's contribution to gross revenue, or according to some other logical formula.

Some types of overhead costs are best allocated according to use. For example, fuel, repairs, depreciation, and machinery lease payments can be summed and divided by the total crop acres farmed to come up with a cost per acre, which in turn is multiplied by the number of acres in each crop enterprise. A more precise allocation would take into account the hours or days each machine is used on each crop, but that would require very detailed records. The cost of wages and benefits paid can be allocated based on an estimate of how much time hired employees spend on each enterprise.

Internal Transactions

Sometimes one enterprise produces a commodity that is utilized in turn by another enterprise. The most common example is home-raised feed. Corn or hay that is fed on the farm should be valued at its opportunity cost, that is, the price for which it could have been sold minus transportation or other marketing costs saved. That value is then assigned as income to the corresponding crop enterprise and an expense to the livestock enterprise that utilizes the feed. Total profit is not affected, because the two values cancel out for the whole farm.

Another example of an internal transaction is the value of manure produced by livestock and applied to crops. It can be valued based on the potential cost saving from the commercial fertilizer it replaces. This value would be designated as a cost to the crops and as income to the livestock, with the hauling costs assigned to livestock.

When livestock operations are broken into phases, the value of the young stock transferred should also be entered as an internal transaction.

For example, the value of weaned calves would be income to the cow-calf enterprise and a cost to the feedlot enterprise. In effect, one enterprise is "selling" the product to another enterprise. Realistic transfer values should be used to avoid biasing the profit estimates in favor of one enterprise or another.

Cost Centers

Larger farming operations may want to track expenses of certain "cost centers." Cost centers provide services to other enterprises on the farm, but do not generate any revenue themselves. Common examples are the farm's line of machinery, a feed mill, or an irrigation system. The cost per hour, acre, or ton of service provided can be tracked and compared with the cost of obtaining the same services from an outside source, such as a custom machinery operator. The unit cost can then be charged to each profit center based on its corresponding level of use.

Accounting Systems

Most whole-farm accounting programs also have the ability to perform basic enterprise analysis. Considerable care should be taken to clearly define the enterprises to be analyzed and to set up the chart of accounts in such a manner as to make it easy to assign income and expenses properly. The accounting system must also allow internal transactions between enterprises to be made.

The computer can quickly sort through all receipts and expenses, collect and organize those that belong to a particular enterprise, and present the results in total dollars per acre or some unit of output. Some programs also have a procedure for automatically allocating overhead costs among enterprises.

Example

Table 1 shows an example of a profit and loss statement in which income and expenses are divided into three enterprises; corn, soybeans, and finishing hogs. A fourth column is reserved for overhead expenses and miscellaneous income that do not pertain directly to the enterprises. Machinery expenses were allocated according to the number of acres of corn and soybeans after subtracting an estimated cost to the hog enterprise. Net overhead was arbitrarily divided evenly among the three enterprises.

Note that before adjustments hog finishing appeared to be the most profitable enterprise, but after charging the value of home-raised corn fed to the hogs, and adding a credit for the manure they produced, they were actually less profitable than corn.

Because the internal transactions all cancelled out, net income for the whole farm was the same before and after adjustments were made.

Table 1. Profit and loss statement with enterprise accounting

	Whole Farm	Corn 315 acres	Soybeans 235 acres	Finishing Hogs	Overhead
Income					
Corn sales	\$102,644	\$102,644			
Soybean sales	77,271		\$77,271		
Hog sales	271,700			\$271,700	
Crop insurance payment	25,648	<u>16,899</u>	<u>8,749</u>		
Miscellaneous income	<u>3,000</u>				<u>\$3,000</u>
Total income	\$480,263	\$119,543	\$86,020	\$271,700	\$3,000
Expenses					
Seed	\$45,666	\$31,589	\$14,077		
Fertilizer	42,598	42,598			
Pesticides	25,280	11,588	13,692		
Fuel and lubricants	21,500	9,450	7,050	\$5,000	
Machinery repairs	23,500	12,600	9,400	1,500	
Building repairs	9,422	1,961	1,961	5,500	
Wages	26,147	<u>6,000</u>	<u>5,647</u>	14,500	
Insurance	4,895				\$4,895
Property taxes	17,663				17,663
Interest	10,500				10,500
Livestock health	9,568			9,568	
Purchased feed	79,871			79,871	
Purchased livestock	64,000			<u>64,000</u>	
Depreciation	23,642				23,642
Miscellaneous	<u>4,800</u>				<u>4,800</u>
Total expenses	\$409,052	\$115,786	\$51,827	\$179,939	\$61,500
Net Income, unadjusted	\$71,211	\$3,757	\$34,193	\$91,761	\$(58,500)
Internal transactions					
Raised corn fed		\$67,000		\$(67,000)	
Swine manure credit		(14,662)		14,662	
Net overhead allocation		<u>(19,500)</u>	<u>\$(19,500)</u>	<u>(19,500)</u>	<u>\$58,500</u>
Net income, adjusted	\$71,211	\$36,595	\$14,693	\$19,923	\$ -

Accounting Period

Most farm businesses use the calendar year as their accounting period. For enterprise accounting, though, it is more logical to summarize costs and returns over the relevant production period. For a specific grain crop this might start with fall fertilizer applications and end with final spring grain sales 18 months later. The costs and revenues for one year's crop could stretch over three normal accounting years. In some accounting systems another digit is added to the enterprise code to indicate the year, such as a "6" for the 2016 corn crop. On the other hand, for a feeder pig finishing enterprise each group of pigs could be summarized separately, with an accounting period only 4 to 5 months long. In that case only a portion of the annual overhead costs should be charged to each group. Other enterprises, such as dairy, have continuous production, so the calendar year or any other arbitrary period can be used.

Comparing Enterprises

Tracking income and costs by enterprise helps identify the real sources of profits in the business, and provides factual data for either expanding or discontinuing certain activities. Different crop enterprises can be compared based on profit realized per acre. One word of caution is needed, however. Enterprise analysis does not identify or value any complementary or detrimental interactions between enterprises.

For example, corn may appear to be more profitable than a legume crop such as soybeans or alfalfa. However, growing continuous corn actually may be less profitable than a rotation containing other crops that contribute nitrogen to the soil, break up pest cycles, or spread out peak workloads. Where the presence of one enterprise significantly affects the performance of another, a whole farm approach must be used in which various crop rotations or even whole-farm plans are compared.

Value-added Enterprises

Some activities are intended to increase the net income received from a commodity after its production cycle has ended. These are known as "value-added" enterprises. Examples include processing milk, fruits, or vegetables into food products; sorting and packaging products by size or quality; and selling livestock as processed meat. Most processes that add value to products also add costs, though. The activities designed to add value can be analyzed as a separate enterprise. The price that the product could have been sold for without further enhancement can be used to transfer it into the value-added enterprise. In the end, the enterprise analysis will tell the manager if the value added to the product is sufficient to pay all the added costs incurred.

Marketing can also be considered a value-added enterprise. The grain enterprise analysis can be terminated at harvest, with the product being valued at its harvest time price and then transferred to the marketing enterprise. Items such as broker's fees, options premiums, storage charges, transportation, and extra drying costs can be charged to the marketing enterprise. The final selling price, including any gains from hedging or purchasing options, constitutes the marketing revenue. The net income to marketing shows whether the manager added value to the product with his or her marketing skills or would have been better off simply selling the crop at harvest.

Comparing Land Units

Some crop producers rent land from multiple owners for different rental rates or under different types of lease arrangements. Some of these rented farms may be more productive than others. It is useful to compare the profitability of different land units, especially if their leases can be renewed or terminated yearly. Each farm can be considered a separate profit center. The same rules that were discussed earlier for allocating costs apply. If records allow, cost of inputs can be

adjusted for each farm, such as when some units require higher rates of fertilizer application than others. In other cases the total cost for a certain input may simply have to be averaged across all crop acres. It is very important, though, that the quantity of product harvested from each farm be recorded accurately, in order to fairly assess and compare the profitability of each one.

Finally, an average profit per acre for each land unit can be found based on the income, expenses and number of acres of each crop grown on that unit. Farms that consistently show a net loss, or do not at least produce enough income to pay all variable costs plus

the land rent, should be dropped from the land base. Some tenants rank all their rented farms by profitability each year, and try to replace the least profitable land units. The cost and income summary also can be used to estimate a reasonable rental rate for each farm.

Summary

Enterprise accounting has many uses. It takes extra effort, but the information it provides is well worth it. This year might be a good time to overhaul the operator's accounting system to find out which enterprises are performing well and which ones are not.

Example

Table 2 shows a comparison of five land units under different lease arrangements. The farms with the highest yields were not necessarily the most profitable, due to differences in input costs and rental rates.

Table 2. Comparison of land units, \$ per acre

	Turner Farm	Richland Twp.	Olson Estate	Aunt Elizabeth's	Loftsted Farm
Acres planted	185	214	144	301	175
Land tenure type	Cash	Cash	Custom	50-50	65-35
	rent	rent	farm	share	share
Bushels produced per acre	184	215	n.a.	188	176
Gross income - corn@<u>\$3.60</u> (operator's share)	\$662.40	\$774.00	\$135.00	\$338.40	\$411.84
Variable costs per acre (operator's share)					
Seed	\$125.00	\$112.00		\$49.00	\$71.50
Fertilizer	145.00	116.00		65.00	81.25
Pesticides	36.73	33.15		17.47	15.89
Crop insurance	12.70	14.56		6.26	8.55
Fuel, oil and repairs	40.00	40.00	<u>\$40.00</u>	40.00	40.00
Grain drying	<u>23.13</u>	<u>26.75</u>		<u>18.81</u>	<u>14.22</u>
Total variable costs	\$382.56	\$342.46	\$40.00	\$196.54	\$231.40
Land rent	<u>\$242.00</u>	<u>\$325.00</u>	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$0.00</u>
Return over direct expenses and rent	\$37.84	\$106.54	\$95.00	\$141.86	\$180.44

... and justice for all

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