

# Production and Marketing Costs

## Effective Financial Management

Strategies for managing production and marketing costs ensure greater profitability and stability, especially for direct marketers who decide to expand and diversify their operations. In developing these strategies, it is important to understand concepts such as fixed and variable costs, depreciation, and interest. These concepts can help you develop budgets that can be used, along with breakeven analysis, to strategically maximize your profit potential. Overall, you can use production and marketing cost planning to:

1. Determine input requirements for production and marketing, such as chemicals, fertilizer, fuel, labor, and packaging materials
2. Develop a sound marketing plan, which begins with selecting the appropriate crop mix and determining prices necessary to cover total production costs and a profit margin
3. Prepare a cash-flow system necessary to support any applications for credit
4. Determine the amount you can afford to pay for land rent, marketing space, and other capital assets used in your production and marketing

## General Budget Analysis

Production and marketing cost information is essential for planning financial stability and profitability. Profit is determined by subtracting production and marketing costs from gross returns. It is a planned return, not something that is “left over” at the end of your production or marketing year.

Gross returns are calculated by multiplying prices received for each commodity by the quantity of that commodity produced and sold. Production and marketing costs include both a fixed and a variable cost component. Variable costs are the out-of-pocket costs for inputs such as fertilizer, fuel, repairs, hired labor, and packaging. Variable costs change directly with business volume; i.e., with the number of acres planted, plants raised, or products sold. Fixed costs include capital improvements and do not vary with production volume—in fact, they occur even if there’s no production. Fixed costs include depreciation, interest, hazard insurance, property taxes, and housing.

Depreciation and interest, which are costs of owning an asset, are prorated over the useful life of the asset. Annual straight-line depreciation is calculated by subtracting the salvage value of an asset from its initial investment value, and then dividing the remainder by the years of useful life. For example, a \$5,000 investment with a 10-year life and a \$500 salvage value would have an annual depreciation of \$450:

$$(\$5,000 - \$500) \div 10 \text{ years} = \$450$$

## *Farmer-to-Consumer Marketing: The Series*

A successful direct farm marketing business requires knowing and understanding effective marketing and management practices.

This series of Extension publications, PNW 201–206, provides information about establishing and developing a direct farm marketing business. Production and marketing costs, management practices, personnel management, and financial management are among the topics discussed.

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If the piece of machinery was used over 10 acres, the per-acre depreciation to include in production costs would be \$45:

$$\$450 \div 10 \text{ acres} = \$45/\text{acre}$$

The straight-line depreciation method is suitable for developing conventional cost estimates, but other depreciation methods may be more appropriate for calculating income tax liability. This is a good topic to discuss with your tax adviser.

Interest cost, the second major component of annual, fixed ownership costs, is calculated by determining the average investment and multiplying by the applicable rate of interest. The average investment is simply the initial investment plus an estimated salvage value, divided by 2. The annual interest for a \$5,000 investment with a \$500 salvage value and an interest rate of 10 percent would be \$275:

$$(\$5,000 + \$500) \div 2 = \$2,750; \$2,750 \times 0.10 = \$275$$

Using the 10-acre example, interest component of the annual ownership cost would be \$27.50/acre:

$$\$275 \div 10 \text{ acres} = \$27.50/\text{acre}$$

Include interest as an ownership charge whether or not you borrowed to finance the machinery or equipment, because there is an “opportunity cost” of having money tied up in machinery. In other words, the money could be earning interest elsewhere if it were not invested in those assets. If the asset is debt financed, include the actual interest charge as a cash expense.

To illustrate the concepts of fixed and variable costs, a hypothetical budget has been developed for an imaginary crop called tribbles. Tribbles are an annual vegetable crop bred especially for the Northwest climate. They are a highly nutritious vegetable that usually yields 3,000 lb/acre. They have a long shelf life and are well suited to direct farm-to-consumer marketing.

Production costs for tribbles are in Table 1. The typical out-of-pocket or variable costs include fertilizer, seeds, insecticide, herbicide, hired labor for production and marketing, packaging materials, repairs, and tractor fuel and lubrication.

To facilitate budget revision and analysis, include both the price and the number of units in the budget. Notice that interest on operating capital is included in variable costs. Interest is included as a cost, even though all operating costs may be financed by the grower. Interest on investment capital is included but as a fixed cost. Interest should be included as an opportunity cost for both investment and operating capital.

In calculating interest on operating capital, all preharvest cash costs are totaled and then multiplied by the fraction of the year they are outstanding. For example, if the period between planting and harvest was 4 months, then cash production costs would be tied up in the crop for one-third (four twelfths) of the year.

Multiplying one-third of the variable costs by the cost of money (interest rate) provides the charge for interest on operating capital. Fixed costs in the budget include interest and depreciation on machinery and equipment used

**Table 1. Summary of costs and breakeven prices for direct-marketing tribbles (1 acre on a 10-acre farm).**

Item	Price or cost per unit (\$)	Quantity	Value or cost (\$)	Your farm
<b>Variable costs</b>				
Nitrogen (lb)	0.18	200.0	36.00	
Potash (lb)	0.10	225.0	22.50	
Phosphate (lb)	0.20	250.0	50.00	
Seed (lb)	18.00	2.0	36.00	
Seed treatment (oz)	3.00	2.0	6.00	
Insecticide (quart)	4.00	1.5	6.00	
Herbicide (quart)	6.00	3.0	18.00	
Packaging	0.01	3,000.0	30.00	
Tractor fuel & lube (acre)			20.00	
Tractor & equipment repair (acre)			10.00	
Hand-harvest labor (hr)	3.50	20.0	70.00	
Marketing hand labor (hr)	3.50	20.0	70.00	
Interest on operating capital (\$)	0.10		10.00	
<i>Total</i>			384.50	
<b>Breakeven price over variable costs</b>			0.128	
<b>Fixed costs</b>				
Market stand depreciation & interest	5.00	1.0	5.00	
Machinery interest & depreciation	18.00	1.0	18.00	
Equipment interest & depreciation	12.00	1.0	12.00	
Taxes	100.00	1.0	100.00	
Net land rent	0.08	4,000.0	320.00	
<i>Total</i>			455.00	
<i>Total costs</i>			839.50	
<b>Breakeven costs</b>			0.28	

to produce tribbles. In the example, fixed marketing costs would include an investment in a roadside stand. To simplify, the tribble budget assumes that the entire farm is devoted to tribble production.

In typical practice, however, several commodities are produced on the same farm with the same set of machinery and may be marketed through the same marketing facilities. Budget construction in this case requires allocating machinery and other fixed costs to each crop. Real estate taxes also are fixed costs, but since they are on a per-acre basis, it is relatively easy to assign them to a particular crop.

Land rent or land charge is assigned to the approximate market value of the land. With a market value of \$4,000/acre for land and an 8-percent interest rate, the land charge would be \$320 for each acre used in tribble production.



**B**udgets are only  
as good as their  
assumptions.

Using, again, the opportunity-cost concept, we calculate the value of land by subtracting the sale cost and any capital gains tax due from estimated market value. The result is the amount that could be earning interest if the land were sold. In the rare case of the part-time farmer who has no alternative use for owned land, it may not be appropriate to assign the land charge to an enterprise. If an estimate of the total cost of production is desired, however, a land charge is necessary.

### ***Tailoring a Standard Budget***

The Extension Services of Oregon, Idaho, and Washington have developed a number of enterprise budgets for growers of fruit and vegetable crops. Budgets, however, are only as good as their assumptions. With the tremendous geographical differences and the wide variation in possible cultural and management practices in the Northwest, it is very important to tailor published budgets to individual farm circumstances.

The budget formats in this publication invite you to make adjustments to reflect your own production and marketing realities. Your Extension office can help with adjustments to yield and technical production recommendations. Sometimes, Extension agents and specialists have access to price information. You can supplement this information with additional information you receive from other growers and marketers.

To help you decide whether to produce tribbles on your farm, we're assuming you got a tribble budget from your Extension office. But is this budget appropriate for your operation? A review of variable cost items in Table 1 (page 3) will help answer the question. For example, is nitrogen really available to you at \$0.18/lb these days?

The largest variable cost in the tribble production budget is 40 hours of harvesting and marketing labor, which the standard budget prices at \$3.50/hr. If you are not yet familiar with tribble production and marketing, you might not know whether 40 hours is a valid number, but you *can* evaluate the wage rate. Is it possible today to hire labor at \$3.50/hr? Is it practical, let alone fair, to expect even family members to accept a wage of \$3.50/hr? In effect, that would require family members to sacrifice in the short run to reduce cash flow problems related to your direct farm marketing enterprise.

Fixed costs are a little more difficult to evaluate and tailor. The tribble budget lists machinery, equipment, and market stand ownership costs. However, the budget does not describe the equipment and stand or the replacement costs for each. Also unknown is the number of acres on which the machinery is used and whether it is used only for tribble production or for other commodities as well. These assumptions, usually supplied in a narrative, need to be analyzed to determine whether the fixed costs are appropriate and whether an added investment is required.

## Breakeven Analysis

If you own all the machinery and equipment, including the market stand, and have control over the land, what budget information is relevant to determine whether or not to raise tribbles?

What if tribbles could be sold for \$0.35/lb and an average yield for an established producer is 3,000 lb/acre? Notice that the breakeven price to cover variable costs is \$0.13 (Table 1, page 3):

$$\text{Total total variable costs } (\$384.50) \div 3,000 \text{ lb} = \$0.13/\text{lb}$$

The difference between \$0.13 and the market price of \$0.35—that is, \$0.22—is money available to cover fixed costs and to provide a return to management and unpaid family labor.

The breakeven price to cover total costs is \$0.28/lb:

$$\text{Total cost } \$838.50 \div 3,000 \text{ lb} = \$0.28/\text{lb}$$

The difference between total costs and total revenue (the latter equals number of production units times market price per unit) is net profit. Net profit in this case is the return for your risk of loss, unpaid family labor charges, and your management. In the example, total costs are \$0.28/lb and total revenue is \$0.35/lb. The difference of \$0.07/lb is the net profit. Given other business opportunities that you may have, is \$0.07/lb net profit sufficient as a return? Only you can judge.

## Variable Cost Decision Making

What would you do if, at harvest, the highest price for the tribble crop is \$0.10/lb? Should you plow down the crop or harvest it? To make the best decision, you need to evaluate the appropriate costs. The decision rule is that if expected returns exceed additional variable costs, then production (harvest and sale) should proceed. All fixed costs may not be covered but, as long as variable costs are more than covered, some contribution toward fixed costs will result.

At the time of harvest, all production costs committed up to that point are fixed. The seed and applied nitrogen and insecticides are just as fixed as taxes and machinery ownership costs. The relevant cost at this point is the harvest and packaging variable costs, which are:

$$\begin{aligned} &(\text{Hired labor harvest and marketing costs } \$140 + \text{ packaging cost } \$30) \\ &\div 3,000 \text{ lb} = \$0.057/\text{lb} \end{aligned}$$

Given the \$0.10/lb crop price, you would be better off by \$0.045/lb to harvest and sell. Even though \$0.10/lb will not begin to cover even the out-of-pocket expenses, it does contribute something to the bundle of costs fixed at harvest and therefore the crop should be harvested and sold. To say it another way, you will lose fewer total dollars.

## Identifying Profitable Crops

Deciding which is the most profitable crop to grow is a process of elimination. The first step is to eliminate crops that cannot be produced in your area due to factors such as soil type, water supply, and climate. For example, a crop infeasible in the Pacific Northwest is Olallieberries. Although developed by U.S. Department of Agriculture plant breeders at Oregon State University in the 1940s, they are unsuited for commercial production in the Pacific Northwest, thriving instead in the warmer growing environments of California.



**The “what-to-sell?” decision might well involve crops other than those you produce on your land.**

Many growers use a very practical way to speed this decision making. They simply observe what crops are grown in the area. Visiting with producers can give you a good feel for what is practical. Your Extension agent can help confirm this information and provide insight on what crop combinations and production schedules you might want to follow. After you make a preliminary list of crops you might produce, the next

step is to full-cost each one and then determine whether prevalent or likely prices are sufficient to return an acceptable profit level.

Evaluate the profit potential of each crop singly and in combination with other possible crops on your list. Start by estimating returns above cash costs for all crops considered. To simplify the initial process, compare annual crops with annual crops and perennial crops with perennial crops. After evaluating annual and perennial crops separately, compare them for profit potential and develop a land use plan that might include both.

Evaluation involves estimating returns above cash costs; see Table 1, page 3. Estimate gross returns by multiplying estimated yields by expected crop prices. Gross returns, however, are not a measure of profitability. Cash costs necessary to produce the crop must be subtracted from gross returns. Cash costs include expenditures for seed, fuel, fertilizer, chemicals, hired labor, and all other out-of-pocket expenses incurred in producing the crop.

Subtract cash production costs from gross returns to find the return to fixed costs. This is the money available to cover the ownership and investment costs, including land, machinery, marketing, fixed facilities, and a return to your management and labor. For perennial crops, the return to fixed costs also includes a return-to-the-stand establishment investment. The idea is to recoup your investment in establishment costs over time by assigning an annual “establishment cost” line item in the operating budget; the line includes interest on invested dollars still outstanding. By the end of the useful life of the established perennial crop, the outstanding investment dollars will have been reduced (amortized) to zero.

The crop with the highest return to fixed costs is the most profitable crop. However, you need to consider other factors, too, before deciding to plant all available land to the most profitable crop.

Risk management is important. You probably would be ill-advised to plant all available land to the most profitable crop, because of the risk of a crop or market failure. Instead, a broader product mix may avoid complete crop failure and attract more customers. In many areas of the Pacific Northwest, multiple cropping on the same land is possible and should be considered. Also consider

crop rotations and agronomic factors such as soil science, plant cultivation, and pest control. Your local Extension office will be a wealth of information on these topics.

A crop mix that provides saleable products over a longer calendar period might make better use of available labor, land, machinery, and marketing facilities. Other considerations include available cash and the availability and cost of machinery and equipment necessary to produce certain crops. Some perennial crops such as tree fruits and berries require a relatively long establishment period before production begins. Annual crops, on the other hand, produce a saleable crop in the year of planting.

Other important considerations are your personal preferences, ability, and background as a direct marketer. Generally, you will do a better job of producing and marketing the commodities that you are most interested in. Perishability may be another important factor in deciding what crops to grow for direct marketing.

Applying all the constraints to a crop ranking is perhaps more an art than a science. The important points to remember, however, in determining what to grow, are the selection of possible crops, ranking crops according to profitability, and developing land use plans based upon your personal preferences, long-run productivity of your farm, and profitability.

The “what-to-sell” decision might well involve crops other than those you produce on your land. For example, you might buy some products for resale, to attract more customers and hopefully to sell more of the crops that are most profitable for you to grow and market. Farm-produced goods such as cider, jams, and jellies may be profitable additions to your direct market outlet; to find out, use the same procedure to calculate their gross margins as you used to select which crops to grow.

In estimating the profitability of your farm direct marketing enterprise, it is important that you full-cost every resource that you use to both produce and market your products. Some growers full-cost only part of their operation. The classic case is meticulous attention to the costs and returns of marketing but underestimating the cost of producing the raw product. While cash may not actually move from one pocket to the other as you shift from harvesting to marketing, your marketing operation should be “purchasing” the raw product from your production operation at a price that gives you an acceptable profit.

The rule in a business is that nothing is provided for free. It is relatively easy to keep track of cash expenses: the fertilizer bill, the fee for selling at the farmers market, or the cost of certifying the accuracy of a produce scale. However, the noncash expenses related to your labor and management, capital investment, and prorated farm machinery and equipment use can be easily lost unless you pay close attention to full-costing both your production and marketing enterprises.

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