Using Enterprise Budgets to Make Decisions

Ag Decision Maker

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Introduction

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 a corn and soybean enterprise budget. Vegetable farmers who grow 35 to 40 different kinds of produce, may wish to develop budgets only for their key products (those products that they believe contribute the most to attaining their goals).

Why use enterprise budgets? In economic terms, enterprise budgets help to allocate land, labor, and capital, which are limited, to the most appropriate use. The most appropriate use is defined by the person in control of the resources and may be used to maximize profits, minimize soil loss or achieve any other goal.

Table 1 is an example of an enterprise budget for carrots. Note that the budget is divided into five sections. The first section illustrates the total receipts the enterprise provides on a set unit(s). In this case, the units are on a lb. ($0.80) and a bed basis ($136). Records should be kept on both a sales unit (per lb.) and land unit (per bed) basis.

The second section records the costs of planting the product. These costs are segmented for two reasons. First, they are incurred whether a product is sold or not. Once the seed is planted or weeding is completed, it is a sunk cost and needs to be covered from some source. The second reason is the time delay between pre-harvest expenses and the time the product is sold. These expenses may have to be covered from borrowing or savings or some other source. Therefore, interest on pre-harvest costs should be included as a production expense.

The third section is the harvest component. Pre-harvest and harvest expenses are combined to equal total variable costs.

The fourth section relates to ownership costs for fixed resources. Each producer owns or controls assets such as land, machinery, or irrigation equipment that they use to produce income. Ownership costs are an allocation to realize some return for the use of those assets. In this example, the land use cost is $160 per acre. It is assumed that produce is grown on 70 beds per acre so the $160 cost is shared by the 70 beds, or $2.29 per bed. Machinery ownership cost is assumed to be $7.14 per bed or about $500 per acre. Machinery is assumed to have a three-year life so the total machinery investment for replacement purposes is $1,500 per acre. Therefore, a 3 acre produce farm would have approximately $4,500 worth of machinery investment that could be replaced every 3 years. The irrigation system is assumed to need replacement every 3 years for a total per acre investment of approximately $240. Total ownership costs are estimated at $10.57 per bed.

The last section is the summary of returns. Total costs equal variable and ownership costs combined. The return over variable costs is equal to total receipts minus total

Table 1. Carrot Enterprise Budget

Carrots: 100' x 4' bed

	Quantity		Your Quantity	$/Unit	Your $/Unit	Total	Your Total
Receipts							
Carrot sales	170	lbs		0.80		$136.00	
Total Receipts						$136.00	
Planting Year							
Supplies							
Seed - cover crop	0.75	lbs		0.60		$0.45	
Seed	3	packets		1.50		4.50	
Burlap	3	bags		1.80		5.40	
Fertilization	10	lbs		0.15		1.50	
Labor							
Cover crop	0.05	hrs		10.00		0.50	
Bed preparation	0.20	hrs		10.00		2.00	
Fertilizer spreading	0.10	hrs		10.00		1.00	
Planting, laying burlap	0.20	hrs		10.00		2.00	
Irrigation set up	0.25	hrs		10.00		2.50	
Weeding	0.75	hrs		10.00		7.50	
Interest on pre-harvest costs	$27.35			0.035		0.96	
Total Pre-Harvest Costs						$28.31	
Harvest							
Bags (1 lb)	170	bags		0.03		$5.10	
Labor							
Harvest labor	3.50	hrs		10.00		35.00	
Packaging	0.30	hrs		10.00		3.00	
Total Harvest Costs						$43.10	
Total Variable Costs							
Per bed						$71.41	
Per lb						0.42	
Ownership Costs (Annual)							
Irrigation system						$1.14	
Machinery						7.14	
Land						2.29	
Total Ownership Costs						$10.57	
Total Costs (Annual)							
Per bed						$81.98	
Per lb						0.48	
Annual Returns Over Variable Costs						$64.59	
Annual Returns Over Total Costs						$54.02	

variable costs. The return over all costs is total receipts minus combined variable and ownership costs. In the carrot example, return over total costs is approximately $54 per bed.

Types of Decisions

There are numerous decisions that can be made with the help of an enterprise budget. In this publication we will focus on three; pricing, changing production practices and product mix.

1. Pricing

Pricing products that do not have an established market can be difficult. Produce, like many other types of products, can be priced based on one of three ways; customers, competition, or costs (AG Strategies, 1999 (a) and (b)).

Customer based. Customer based pricing is focused on how the customer values the product. What is he/she willing to pay based on the perceived value of the product? This is very difficult to know when starting out a new business and/or working with a new customer group. To determine the price a customer is willing to pay entails market research which could be as simple as casually talking to a few potential customers or designing and implementing a targeted questionnaire.

There are several pricing strategies that can be implemented within customer based pricing. First, set the price of the product to support its image. For example, many organic products are sold at a premium price. Customers are willing to pay a higher price because they perceive organic products to be healthier and more nutritious. The image of the organic product is that it is of higher value than a non-organic product. Second, set the price to increase volume.

Promotional practices such as loss-leaders, coupon books, or holiday baskets, are used to attract new customers. The hope is that the new customers will purchase additional products at a higher price. Third, develop a range of prices to fit the needs of a variety of customers. To accomplish this, the customer base must be segmented and researched to better understand its needs and how to meet those needs. Fourth, set prices to encourage volume purchases. For example, strawberries could be sold for $3 per quart, or 3 quarts for $7.50. Volume pricing may be common during peak harvest because it may be better to get a lower price for some product rather than incur spoilage. Fifth, bundle low volume products with related higher volume products. Bundling may provide an incentive for some customers who are looking for good values.

There are two primary disadvantages to focusing all the attention on the customer's willingness to pay. First, production costs are ignored. Each and every product could be selling at a loss. Second, competition is ignored. Similar products may be selling at a more profitable price or being purchased by a larger customer base.

Competition based. It is important to know who the competition is and what they are doing. Competition may occur with the same products or similar products. For example, spinach competes with other spinach as well as lettuce and other greens. Understanding the competition will take time and research. Questions such as; how

many competitors are in the market, how much total product is produced, where the products are grown, need to be understood if pricing is to be based on competition.

Within competition based pricing there are three primary strategies. First, set prices the same as competitors for similar products. If the products are unique or specialized, pricing can be set differently. Second, set lower prices than the competition to entice new buyers. This strategy is used to gain potential new customers. Product is likely to sell quickly at lower prices so volume is necessary. The third strategy is to determine a price that will maintain a percentage of the market, or market share. This is a common strategy following an initial lower price to entice new customers.

Competition based pricing ignores production costs. Again, all products could be selling at a loss. Secondly, lowering prices to entice new customers could be copied by the competition, resulting in a "price war".

Cost based. To ensure that products are being sold for a profit, costs need to be determined. A budget as described earlier in this bulletin needs to be developed for each product that contributes substantially to the overall profitability of the business. Budgets need to include all costs of production as well as transaction costs to get the product from the farm or business to the customer. Secondly, a profit margin or percentage should be added to the costs to help cover family living and other considerations.

Cost based pricing does not take into consideration the customer and what he/she is willing to pay for the product. Competition is ignored as well. Competitive pricing may make it impossible to cover all production and transaction costs.

Pricing summary. No one pricing strategy works without considering the other two. However, to price products without knowing costs to produce those products could lead to a business failure. It may make sense therefore to start with costs and then consider both the customers and the competition. In the long run, if costs of production are above competitors' price level, some way must be found to reduce costs or a different product should be tried.

2. Changing production practices

As previously mentioned, enterprise budgets are used to track expenses and revenues for a particular enterprise. Expenses can be used to calculate break-even prices and yields. For the carrot example, total costs per bed were $81.98. Cost per lb of carrots sold was $.48 ($81.98 divided by total sales of 170 lbs.). Producers can use the $.48 per lb figure to compare to other producers to determine if their individual costs are high or low in comparison. If costs are high, then the budget should be evaluated in detail to determine where costs are different 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, $43.10 (53 percent) of the total cost of $81.98 is in the harvesting activities. Another way to look at the details is that $54.46 (66 percent) of the costs is labor. As a key expense, the producer can reevaluate labor requirements to determine if there are changes that can be made to become more labor 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 ($11.85 per bed or 14 percent of the total) don't need to be analyzed in as much detail because a 10 to 20 percent reduction in supplies does not affect the total production costs significantly.

Production practices summary. Changes in production practices that can reduce production costs without affecting yields can increase profitability. Without detailed records the effect of changing production practices on profitability is not known.

3. Product mix

Enterprise budgets allow the producer to compare profitability and labor use among the various crops grown. For the carrot example returns over total costs were $54.02 per bed (Table 2). Labor use was 5.35 hrs. The returns over total costs per hour were $10.10 per bed. The carrot enterprise should be compared to other crops that could be grown. Chase (2006) includes budgets for 13 crops in addition to carrots. A quick comparison indicates annual returns over total costs per bed range from $35.47 for asparagus to $547.21 for heirloom tomatoes. Labor use also varies significantly

Table 2. Comparison of Economic Returns and Labor for Various Enterprises[1]

Vegetables	Returns over Total Costs	Hours of Labor[2]	Returns over Total Costs per Hour
Asparagus	$ 35.47	2.95	$ 12.02
Basil	164.19	6.90	23.80
Carrots	54.02	5.35	10.10
Cherry Tomatoes	181.11	11.20	16.17
Eggplant	85.02	6.45	13.18
Specialty Green Beans	140.27	18.25	7.69
Garlic	43.89	7.15	6.13
Greens	102.90	2.80	36.75
Heirloom Tomatoes	547.21	11.20	48.86
Potatoes	61.65	5.10	12.09
Red Raspberries	131.50	6.15	21.38
Snow Peas	58.45	7.65	7.64
Strawberries[3]	55.46	1.55	35.78
Sweet Potatoes	27.48	4.30	6.39

[1] Source: Chase (2006 forthcoming), "Iowa Vegetable Production Budgets", Iowa State University, Iowa State University Extension, (PM 2017).

[2] Hours of labor for asparagus, red raspberries, and strawberries are average hours from establishment through the life of the production period.

[3] Strawberry numbers were converted from a per acre basis to a per bed basis for comparison purposes. Seventy beds per acre were assumed for the conversion.

between individual crops. For example, strawberries took only 1.55 hrs on a per bed equivalent to produce and harvest, whereas specialty green beans consumed 18.25 hrs per bed.

For many vegetable farmers, labor is considered a scarce resource because there are a limited number of hours that can be provided to any farming operation. For that reason it is important to analyze not only returns over total costs, but also returns over total costs per hour. Cherry tomatoes and specialty green beans yield relatively high returns over total costs of $181.11 and $140.27 per bed, respectively (Table 2). However when you take into consideration the number of hours required (11.20 and 18.25 hrs, respectively) per bed, their rankings fall when measuring returns per hour. On the other hand, some crops like greens have average returns over total costs per bed ($102.90) but much above average returns over total costs per hour ($36.75). If labor is not a scarce resource, but land is then returns per bed would be the appropriate column to focus on.

Developing and comparing enterprise budgets should be completed for each crop that either significantly contributes to annual returns over total costs or labor usage. Comparisons of the distribution of labor use are particularly important if crops are harvested at the same time. For example, early harvested crops such as greens, snow peas and some early green beans all compete for labor at the same time.

Budgets for proposed new enterprises should be developed and compared to existing enterprises. When looking at the feasibility of a new enterprise it is often suggested that the producer start on a small scale (Born, 2001). Starting small will allow an enterprise budget to be developed and a comparison made to determine if the new enterprise should be incorporated into the farming system.

Product mix summary. Enterprise budgets should be developed for key enterprises within the farming operation. Comparison of budgets will help determine which product mix best allocates land, labor, and capital to their most appropriate uses.

Summary

An enterprise budget is an estimate of the costs and returns to produce a product and helps allocate land, labor, and capital to the appropriate use. Enterprise budgets can be used to help make decisions such as pricing products, comparing production practices, or developing a product mix that matches business goals.

Pricing products is difficult, but can be based on one of three approaches; customer based, competition based, or cost based. Although no one pricing strategy works without the consideration of the other two, pricing products without knowing costs to produce 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 to be analyzed further.

Budgets also indicate where key costs occur. If key cost items appear too high, changes in production practices should be made to lower per unit costs.

Enterprise budgets should be developed and compared for each product that contributes significantly to annual returns or other business goal. 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 enterprise budgets included in this discussion focus on production costs only. Keep in mind that marketing costs are incurred getting the final product from the farm to the consumer. These costs at times are substantial and vary depending upon the market being targeted. In the final comparison of enterprises, marketing costs need to be included.

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