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Wholesale with confidence by calculating your unit cost

By Jed Beach

Where my wife and I farm on the midcoast of Maine, there is a general sentiment amongst diversified growers that the traditional market channels we've relied upon - farmers markets, CSA's, coops, and farm to table restaurants - have become increasingly saturated and competitive. This is a sentiment that is shared by many of the farms whom I provide business counseling to as well. More farms have sprouted up - something that, in theory, most people want to support - but demand within the high value markets has not increased commensurately. The result is that sales have dipped for many, marketing costs have increased, newcomers are finding it increasingly hard to get established, and feelings of competitiveness, anxiety, and unwillingness to share information are on the rise.

At the same time, demand for local produce at more mainstream retailers and mid-priced restaurants remains fairly high, and supply has not yet caught up. There is a growing sense that, in order for smaller, diversified farms to continue to expand, we will have to figure out how to successfully serve these markets.

There are many challenges to doing this - too many to summarize in a single article - but one of the most important ones is price. While most of the "mid-level" customers do express a willingness to pay a premium for local - usually about 10-20% above their other options - this usually doesn't equate to the price that growers who are accustomed to high value markets are used to. For instance, salad mix around here might wholesale to a coop for \$8-\$9 a pound. A restaurant can get it from their headline dis-

tributor for about \$5.50 per lb. They might pay \$6 or \$6.50 for a local option - but not much more.

For many growers I work with, the instinctive reaction might be to say, "no, thank you - I'll stick with my coops and farmers' markets." But lower prices don't always mean lower profits. I've worked through unit costs with over 40 growers in the four to ten acres of production range, and sometimes, growing the *right* crops for more price sensitive markets is actually more profitable than growing 50 crops for higher value markets. And by getting those right crops to the right customers, small scale growers can access relatively untapped markets while moving the local foods economy into a new frontier.

Enter: unit cost

The key to understanding *which* crops you can grow profitably at lower prices is to understand your *unit cost*. "Unit cost" in business-speak refers to your cost to produce one unit of each of your crops - one bunch of kale, or one bouquet of flowers, or one pound of carrots. When you include the "cost of you" - your minimum profit needs - as one of your costs, calculating unit cost provides you with the *minimum price you need in order to pay all your expenses and yourself*.

Knowing your unit costs provides you with an important business advantage. When you're setting prices with customers, a product's unit cost provides you with the "floor" you can't go below. This is especially important if you are considering expanding into more price sensitive markets. Unit cost calculation is an essential part of any sound pricing strategy, as equally important as market-based pricing.

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Unit cost

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Calculating Unit Cost

The calculation for unit cost is deceptively simple: you take all the costs associated with one crop, and divide them by the total units sold. It usually helps to divide your costs into two different categories: variable and fixed. Variable costs rise and fall with the levels of production; a general rule of thumb is, “if I want to grow more of X, would I have to buy more of Y?”

Common variable costs on crop farms include seed, fertilizer, packaging, and hired labor. Fixed costs, on the other hand, don’t rise and fall with the level of production - they tend to stay the same, no matter how much you grow. Common fixed costs include insurance, repairs and maintenance of buildings, and equipment depreciation.

With these two types of costs split out, “variable unit cost” equals all the variable costs associated with a crop divided by the total yields. Fixed costs are usually allocated to a crop based on the amount of acreage (or bed space) it takes up, then divided by the total yield, to calculate “fixed unit cost.”

For a farm growing only one crop, calculating unit cost can be relatively easy. Say, for instance, that I only grew kohlrabi. I invest \$100,000 in costs in order to grow 100,000 pounds of kohlrabi. My unit cost for kohlrabi is \$1 per pound (\$100,000 divided by 100,000 lbs.).

For a farm that’s more diversified, however, the process gets a little more complicated. You might purchase compost, wax boxes, and diesel fuel, and hire two fieldhands, and use them to grow tomatoes, kale, and flowers - but

how do you “embed” the costs of those inputs into a variety of different crops and yields?

The next section of this article describes two methods for calculating unit costs on diversified farms, in order of less complicated (but also less accurate) to more complicated (but also more accurate). No matter which method you end up using, they both follow the same principle: *all the costs you incur on your farm need to be “embedded” into all of the units you sell . . . somehow.*

Method #1: rough unit cost

In this method, you:

Add up all of your costs, including your desired profit;


Divide the total costs by the total acreage planted (or bedfeet, or square feet, etc.) to calculate a “cost per acre”;

Divide this “cost per acre” by the yields sold per acre for a particular crop to calculate its unit cost.

This method is venerable and one of the most popular ways to calculate unit costs. It is relatively easy - the only records you need for this calculations are records of costs, plantings and units sold. If you lack the records necessary to create more detailed enterprise budgets, but want to make a first pass at analyzing 40 or 50 crops, this is a good place to start. If selecting the right crops to grow for more price sensitive markets is a funnel, this method starts you at the wide part of the funnel, and helps you get a little narrower.

The major disadvantage of the rough unit cost method is that it is less accurate than a more detailed analysis. Spreading all the costs across all the acreage assumes that each crop uses the same amount of cost per acre - some-

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Unit cost

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thing that is probably not true. For instance, it probably isn't "fair" to expect your zucchini to bear the same pre-harvest labor costs as your tomatoes - and if you grow your tomatoes in a high tunnel, it isn't fair to ask the zucchini to "pay" for a portion of the structure's depreciation when they don't "use" it. To narrow the funnel down to 10 crops (or fewer), we need a more accurate method for unit cost.

Method #2: using enterprise budgets

In order to make a more accurate calculation of unit cost, we'll need to create enterprise budgets. An "enterprise budget" is a statement of the costs and returns of growing a specific crop. Almost all enterprise budget templates contain all the data you need to make a unit cost calculation; they calculate the costs associated with the crop, and the yields.

Resources and templates abound; Chris Blanchard wrote about the topic in the January 2013 edition of *Growing for Market*, and Richard Wiswall's *The Organic Farmer's Business Handbook* is a great reference. Here's my recommendation for how to go about constructing a good enterprise budget:

Establish a unit of yield [lbs., bunches, etc.]

Establish a unit of production [bedfeet, square feet, acres, etc.]

Calculate a net yield sold per unit of production, ideally based on last year's records.

Assess the variable costs directly to the crop based on their usage.

I like to have farms fill in phrases like, "It takes a crew

of X people Y hours to harvest Z bunches." X times Y times the farm's average pay rate gives you total cost; divide this by Z to get harvest cost per bunch.

Or, "We apply X yards of compost per acre at $\$Y$ per yard." X times Y gives you cost per acre; divide this cost by the net yield sold per acre to calculate compost cost per unit.

Add up all the variable costs this way.

Add up your fixed costs (don't forget the portion of your time you spend on non-field labor as a salary), and divide them by the total production [bedfeet, square feet, acres, etc.] on your farm to get a *cost per acre* [or *bedfoot*, etc.]. Divide this figure by the net yield sold per acre to calculate fixed unit cost.

Add up variable and fixed unit costs, and you're done!

In some cases, you may want to divide your fixed costs up amongst several different enterprises; "enterprise" here means a group of crops that use a discrete set of equipment from other crops. For instance, a farm growing field crops, seedlings, and greenhouse tomatoes might separate those income streams into different enterprises; some fixed costs, such as the depreciation on greenhouse structures or propane, might be allocated only to seedlings or greenhouse tomatoes. This division ensures that crops that aren't grown under cover don't unfairly pay the "rent" associated with the structures. Other, more indirect fixed costs (such as insurance) should be allocated to each enterprise in proportion to its share of overall gross sales.

Using unit cost in crop planning

Once you have completed your unit cost calculations, you can use them to compare the relative profitability of your crops:

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Subtract the unit cost from the average price to calculate net profit per unit.

Divide net profit per unit by the average price to calculate that crops *net profit margin*.

Compare the net margins of various crops - those with higher net margins are more profitable.

When crop planning, one way to improve profitability is to fulfill your markets' needs for your highest net margin crop first, followed by the next highest, followed by the next, etc.

If you can fill all of your fields with crops you can sell at prices that are at or above your unit cost - congratulations! You've created a crop plan that goes a long way to ensuring you get to pay yourself your salary goal this year.

Ways to improve unit cost

If you're like many of the growers I work with, however, you may find that you don't have sufficient markets to "fill" your crop plan with crops at or above your unit cost. If there are additional customers that would buy from you, but the prices they can tolerate are below your unit cost, there are ways to lower your unit costs so that you can work successfully with them. Here are four of the most common techniques, in order of generally easiest to implement to hardest:

Match plantings to sales

Unit cost is calculated by dividing costs by net yields *sold*. If you have a significant portion of a crop that is left unharvested due to lack of market, then you will have invested pre-harvest costs to grow more than you needed to. By reducing plantings, you can reduce your preharvest costs while maintaining the same yield. This technique works especially well for crops with relatively high level of preharvest costs, such as tomatoes.

Improve yields

Yields are one half of the unit cost ratio - if your yields per square foot are lower than they could be due to lack of fertility, water, or pest control, a little investment in the right inputs almost always pays benefits in excess of their costs.

Invest in equipment

For most diversified farms, hired labor is the largest cost, and thus

also the largest portion of any crop's given unit cost. While equipment investments do incur extra fixed costs in depreciation and maintenance, if they save significant labor hours then they are often worth considering. In the March 2016 issue of Growing for Market, I explained a method you can use to calculate the "breakeven" point at which a piece of equipment pays for itself in labor savings. Often, those breakevens are lower than most people suspect - diversified farms tend to undercapitalize themselves, and endure higher labor and unit costs as a result.

Increase scale

If you've already covered steps #1-3 thoroughly, then increasing the scale of your farm is the final option to consider for improving unit cost. As the number of acres you put into production increases, yields increase while fixed costs stay flat - which lowers the "fixed cost per unit." This technique works especially well for farms (or crops) where the variable cost is already less than half the average price, but the fixed cost portion is too high.

In this article, my intent was to explain unit cost calculation, describe why using it might be beneficial to your farm, show some methods for calculating unit cost, and lay out some possible approaches for lowering unit costs. It's a big, broad topic that can consume entire courses at business school, so if you have questions as you start to make your own calculations, please do email me at jed@farmSMARTmaine.com and I may be able to help.

In my next article for Growing for Market, I'll be using unit cost to predict some of the crop types that farms at smaller scales can be competitive with in more mainstream marketplaces. Until then, good luck with the beginning of your growing season!

Jed Beach is a farm business consultant and organic vegetable farmer in Lincolnville, Maine. He and his wife operate 3 Bug Farm, where they wholesale greens, herbs and other crops to stores and restaurants. Jed provides business planning services and crop profitability assessments to farmers through his practice, FarmSMART. More information can be found at www.farmSMARTmaine.com.



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