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Shortcuts to Measuring Crop Profitability: Are They Misleading?

by

David Conner, Research Associate

Dept. of Applied Economics and Management, Cornell University

Introduction

Knowing whether a crop is profitable is a crucial piece of information for farm management. Yet for diversified vegetable farms, some growing hundreds of different crops or varieties, measuring this can be a daunting task. Many prominent organic farmers in the Northeast use and advocate the use of a simple rule of thumb: the “\$30 per pick-pack hour rule.” This rule states that for every hour spent harvesting and packing produce by the farmers and their crew, it ought to result in at least \$30 in revenue. For example, if three workers spend two hours picking and one hour washing and packaging a given crop (a total of nine person-hours -- $3 \times 2 + 3 \times 1 = 9$), this product should bring at least \$270 ($9 \times \30) in sales.

Using this rule is much easier than tracking all the costs (inputs and labor, plus indirect and overhead costs) associated with growing a crop. However, data collected over two growing seasons (2002 and 2003) from seven organic vegetable farms in the Northeast cast doubt on the usefulness of this rule. This doubt is based on two main arguments: (1) \$30/hour may not cover the total cost of production, and (2) a key underlying assumption of this rule -- that all production costs associated with raising a crop (excluding harvesting and packing) are roughly equal for all crops -- is violated.

The production costs were gathered on seven organic vegetable farms in five Northeast states. They are participating in the Northeast Organic Network (NEON; see

www.neon.cornell.edu) project and were identified as being “exemplary” farms. While these farms do not represent a random or even a “typical” sample, the results of the following analyses should provide a caution against relying too much on this shortcut measure of crop profitability.

Break-even Analysis

The first analysis measures the break-even revenue per pick and pack labor hour. It is calculated by taking the total production costs (direct variable costs like labor and inputs, plus overhead and indirect variable costs, including land, machinery, maintenance, marketing, etc.) and dividing by the total number of person-hours spent harvesting and packing. Farms that achieve this dollar per hour figure will exactly break even, i.e., will meet all costs but make no profit. A farm that fails to bring in this amount of revenue per hour will lose money; an amount greater than this figure indicates profit.

The following table (Table 1) shows the maximum, minimum, and average break-even revenue figures for each of ten crops. Some crops have only two observations (data from only one farm over two years); others have up to eight. Note that, on average, only four crops (beet, carrot, onion, and strawberry) would actually make money if the farmer only made \$30/pick-pack hour. Five crops (Asian greens, lettuce, string beans, tomatoes and winter squash) would need, on average, to produce over \$50/hour to break even.

Table 1. Summary of Break-even Revenues (\$/hour)

<i>Crop</i>	<i>Maximum</i>	<i>Minimum</i>	<i>Average</i>
Asian Greens	75	35	55
Beet	21	17	19
Carrot	23	23	23
Garlic	38	28	32
Lettuce	75	15	54
Onion	27	23	25
Parsnip	53	29	41
Strawberry	17	13	15
String Bean	100	78	89
Tomato	195	24	85
Winter Squash	90	27	65

Finally, out of 42 data points (all farms, all crops), only 16 would have made money at \$30/hr, while 26 would have lost.

Production Costs Before Harvest

The \$30/hour rule assumes that the costs up to harvest are roughly equal on all crops; data from these seven farms call this assumption into question as well. For each crop on each farm, the harvest and packing labor costs were subtracted from production costs (inputs plus labor). The results were then compared across farms and across crops.

Looking at data from different crops over two years for the same farm, the differences in production costs before harvest are quite large. The costs differ from a minimum factor of 2.71 on one farm to a maximum factor of 10.89 on another. Clearly, costs before harvest are not roughly equal, even on the same farm. Looking at similar crops over different farms and years, the differences are much less pronounced. Four crops (beets, carrots, onions, and string beans) vary by a factor of 1.2 or less. It is important to note, however, that analysis of each of these crops used data from only a single farm; these factors reflect the difference between two consecutive crops years on the same farm. Four crops (garlic, lettuce, tomato and winter squash) vary by a factor of 2.5 or more; these data all come from multiple farms.

Implications

Certainly, the \$30/hour rule has some value. Proponents claim that it may help growers gauge how fast and efficiently the crew is working, as well as providing information on the prices they received. It may also work better for growers who do much of the on-farm labor themselves and have less out-of-pocket labor expenses.

This analysis does suggest caution in relying too heavily on this rule. While this analysis uses data from a small number of crops and farms, the fact that so few would make a profit at \$30/pick-pack hour is cause for concern. Furthermore, the key assumption of roughly equal costs for all crops before harvest is also questionable.

It is a daunting task to measure all costs across all crops on a diversified farm. However, reliance on quick but rough rules of thumb may lead to poor crop choices. Clearly, a measure in between these two extremes is in order. Here are some suggestions:

- Measure all costs for a handful of crops: perhaps select one you believe is a sure money maker, one you think may be less profitable, and one you are unsure about. Calculate and compare the break-even revenue per pick-pack hour for these crops.

- Given that costs for a single crop on a single farm changed little over the two years, do a few in-depth measurements on different crops each year.
- Calculate the break-even revenue for the whole farm (total farm expenses divided by total pick-pack hours), measure this figure for a few select crops, and compare.
- Use, with some caution, published Enterprise Budgets from other sources. Full budgets from the NEON project will be available in a book to be published shortly. Vern Grubinger's *Sustainable Vegetable Production from Startup to Market* contains budgets for several crops; they were compiled several years ago, so some price adjustment may be needed. Organic vegetable budgets from Rutgers (New Jersey) and North Carolina State Universities are also available.

Forms (both paper and spreadsheet) to guide the measurement of small fruit and vegetable crops are available from Dr. Wen-fei Uva, Senior Extension Associate, Department of Applied Economics and Management, Cornell University.

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