

Costs and Benefits of Vegetable Gardening¹

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Introduction

One-third of all United States households participate in food gardening (NGA 2014). Vegetable gardening is the most common type of food gardening (NGA 2014). In 2020, the COVID-19 pandemic generated a surge of interest in vegetable gardening with people confined at home and trying to be more self-sufficient (Yu 2020).

Benefits of gardening are numerous, and motivations vary. One motivating factor for many gardeners is to save money on their food bill. Other gardeners are motivated primarily by nonfinancial aspects of gardening. In either case, it is helpful to consider the cost of gardening relative to the benefits.

The cost of purchasing food (e.g., \$2.00 per pound of tomatoes) or a gym membership (e.g., \$50 per month) is straightforward. Estimating the costs of gardening is not as simple. Does it cost you \$1.00 per pound or \$10.00 per pound to grow tomatoes in your garden? How do you know? This publication serves as a guide for gardeners to estimate the costs of vegetable gardening. But first, we describe the benefits of gardening.

Benefits of Vegetable Gardening

Vegetable gardening can provide many benefits for the gardener and the household. The harvested vegetables are an obvious benefit. Some benefits are based on the individual perceptions of the gardener. For example, people may garden because they enjoy it or perceive better taste from fresh, homegrown produce (NGA 2014).

Other benefits have been determined through scientific research. For example, fresh vegetables gradually lose nutrients after harvest (Barrett). A vegetable harvested from your garden and eaten the same day will have higher nutritional content than an identical vegetable that has spent several days or weeks sitting in storage, transport, and store displays. Numerous other studies have documented the positive effects of gardening on physical and mental health (Armstrong 2000; Soga et al. 2017). Research has also found gardening increases consumption of fruits and vegetables, and even if just one person in a household participates in gardening, it increases fresh fruit and vegetable consumption for all members of the household (Alaimo et al. 2008). Studies have found several benefits for children participating in gardening. For example, they are more likely to eat vegetables (Meinen et al. 2012; Savoie-Roskos et al. 2017), and children participating in school

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garden programs demonstrate an increase in social and interpersonal skills (Robinson and Zajicek 2005) and have improved educational outcomes (Bell and Dymont 2008) and attitudes toward the environment (Mayer-Smith et al. 2007).

Gardening can also provide financial benefits. If you can grow vegetables for less money than it would cost to buy the same vegetables at the grocery store, you gain a financial benefit (cost savings). Langellotto (2014) reviewed several studies of gardening costs and yields. She found that in most cases the value of food produced was greater than the cost, especially when no labor cost was counted. But gardening does require a financial investment, even if a modest one, and there are no guarantees that your savings on grocery expenses will outweigh your gardening costs.

Knowing your cost savings from growing different vegetables can help you choose the most economical crops and assess whether you are getting a financial benefit from gardening. The next section describes how you can estimate your costs and cost savings from your vegetable garden.

Estimating Costs and Savings from Vegetable Gardening

We suggest a framework to help you estimate your costs and cost savings from vegetable gardening. We assume you do not pay someone to garden for you, but your own labor is an important input, too. Any “cost” you assign to your own time and effort is subjective. You may think of the cost savings or other benefits of gardening as the “return” for your labor. You decide whether those benefits are worth the time you spend on gardening.

Our focus is on estimating the costs of materials, including gardening supplies and tools. A common mistake is to leave some costs out, which makes a cost estimate lower than the actual cost. It is important to think about all the materials that go into your vegetable garden.

Your cost savings (or extra cost) depend on three factors: your gardening costs, the size of your harvest, and the price you would have paid for vegetables if not grown in your garden. To know your cost and cost savings from gardening, you will have to keep records of your gardening expenditures and the amount you harvest. A kitchen scale can be used to weigh the amount of each vegetable you harvest.

You can use the blank Vegetable Cost Table (Table 1) to calculate costs for a single vegetable. Start by listing all the

materials you use to grow this vegetable only. Materials that are shared by multiple vegetables will be listed separately in a Shared Cost Table (Table 2). Once you have listed all your gardening materials, including any garden supplies and tools, enter the Original Cost (the amount you paid) for each item. Some of the materials will last for more than one year. In the Use Years column, estimate the number of years you will use each item for gardening before it is replaced. Then calculate the annual cost for each item, which is the Original Cost divided by the Use Years.

Table 4 shows an example Vegetable Cost Table for tomatoes. Direct materials (used only by tomatoes) include the tomato seedlings, tomato cages, and pest management material. Tomato cages are purchased for \$40, and we expect the cages to be used for 4 years before being replaced. Therefore, the annual cost of the tomato cages is \$10 ($\$40 \div 4$). It is not appropriate to assign the entire cost of the cages to your first year’s tomatoes, and no cost to the tomatoes in following years. Instead, we spread out the cost of the cages over the tomato crops that use the cages. Each year’s tomato harvest is assigned a portion of the original cost. Conversely, if you do not commit to growing tomatoes for three additional years, the first year’s cost is much higher.

What if some of your materials are shared by multiple vegetables? Put those shared items into costs groups. Each group should contain items shared by the same vegetables. For example, our raised beds are shared by tomatoes, baby spinach, and carrots. We might also have a hydroponic system to grow various types of lettuce. In that case, we put the raised bed materials into one cost group and the hydroponic system materials into a separate cost group.

You can use the blank Shared Cost Table (Table 2) to list shared materials for one cost group. Enter the Original Cost and Use Years for each item, just as you did for Table 1. Calculate the annual cost for each item by dividing the Original Cost by the Use Years. At the bottom of the Shared Cost Table, list the vegetables sharing that cost group. For each vegetable, enter a percentage of the total group costs that should be allocated to that vegetable. In the second column at the bottom of the Shared Cost Table, you can enter the “allocation base,” which are numbers used to assign a percentage to each vegetable. For example, a percentage based on square feet occupied by each vegetable could be a reasonable way to allocate shared costs. Calculate the dollar amount allocated to each vegetable by multiplying the percentage (as a decimal) times the total shared material annual cost for the group. Your percent allocations for all the vegetables sharing the group should sum to 100%. The dollar amount allocated to all the vegetables should sum to

the total shared material annual cost for the group from the top portion of Table 2.

Table 7 shows an example Shared Cost Table for two raised beds. In our example, baby spinach is grown in one, and carrots are grown in the other during the winter. In the spring, tomatoes are grown in both raised beds. Based on the number of beds occupied (or square feet), we assign 50% of the raised bed costs to tomato, 25% to baby spinach, and 25% to carrot.

In the Vegetable Cost Table (Table 1), you can sum the annual costs of the direct materials (materials used only for that vegetable). Then enter any shared cost allocations from Shared Cost Tables. Sum the annual direct cost plus the shared allocation(s) to get the total annual material cost for that vegetable. Then at the bottom of Table 1, enter the harvest unit (e.g., pounds) and the annual amount harvested. Calculate the total material cost per unit by dividing the total annual material cost by the amount harvested. The total material cost per unit is what you can compare to the price you would have paid for the vegetable at the grocery store.

Tables 4, 5, and 6 show examples for tomatoes, baby spinach, and carrots. Those three vegetables are grown in raised beds. Our estimates for material cost per unit are \$1.48/lb for tomatoes, \$3.33/lb for baby spinach, and \$2.00/lb for carrots.

You can use the blank Cost Savings Table (Table 3) to compare your garden vegetable costs per unit to the price of similar vegetables at the grocery store. Your cost savings per unit is the grocery store cost per unit (price) minus the garden cost per unit. To compare the two, the units must be the same (i.e., track your harvests using the same unit as the grocery store price—pound, dry pint, piece, head, bunch, etc.). In the example shown in Table 8, we save \$0.51 per pound of tomatoes and \$4.67 per pound of baby spinach grown in the garden. But carrots cost us \$0.50/lb more from the garden than from the grocery store.

There may be other benefits to growing carrots in a home garden, but in this example cost savings is not one of them. Every gardener needs to decide whether the benefits outweigh any added cost, or whether the cost savings and other benefits are worth the time spent gardening.

We hope this document helps you estimate the costs for your garden so that you know whether it costs you \$1.00 per pound or \$10.00 per pound to grow tomatoes. If you would rather do cost estimates on a computer and let

the computer do the math for you, an interactive Excel Cost Workbook (<https://journals.flvc.org/edis/article/view/123485/129603>) and an Instructional Video (<https://tinyurl.com/y7mm5eag>) explaining how to use it are available at the links shown. Those tools and others can be found on the UF/IFAS Gardening Solutions website (<https://gardeningolutions.ifas.ufl.edu/get-growing/>).

Conclusions

Vegetable gardening is an activity with many benefits but also some costs. Knowing your costs will enable you to compare the benefits with the costs. Accurately estimating your cost per unit harvested will allow you to calculate the financial benefit (cost savings) from growing different vegetables.

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Table 1. Vegetable Cost Table: Blank

VEGETABLE COST TABLE			
Vegetable:			
Description:			
<i>List materials used to grow this vegetable only. Enter original cost and the number of years of gardening use before replacement. Calculate original cost ÷ use years = annual cost.</i>			
Direct Materials	Original Cost	Use Years	Annual Cost
Total direct materials			
<i>For materials that are used to grow more than one vegetable, add up costs in a shared cost table. Then enter the amount allocated to this vegetable here.</i>			
Shared Material Cost Allocations			Annual Allocation
Shared Cost Table 1			
Shared Cost Table 2			
Shared Cost Table 3			
<i>Add the direct material annual costs and the shared material annual allocations to get the total annual material cost. Enter the harvest unit and amount harvested. Then calculate Total annual material cost ÷ Annual amount harvested = Total material cost per unit.</i>			
		Unit	Annual Totals
Total annual material cost		\$	
Annual amount harvested			
Total material cost per unit			

Table 2. Shared Cost Table: Blank

SHARED COST TABLE			
Cost Group Name:			
Description:			
<i>List materials used for this shared cost group. Enter original cost and the number of years of gardening use before replacement. Calculate original cost ÷ use years = annual cost.</i>			
Materials	Original Cost	Use Years	Annual Cost
Total shared materials			
<i>List the vegetables sharing this cost group. Enter the % allocation for each. For each vegetable, calculate % of Total (as a decimal) x Total shared material annual cost = Annual allocation.</i>			
Vegetables sharing this group		% of Total	Annual Allocation
Total			

Table 3. Cost Savings Table: Blank

COST COMPARISON TABLE			
<i>For each vegetable, enter the unit, the grocery store cost per unit, and the garden cost per unit. Calculate Grocery store cost per unit - Garden cost per unit = Cost savings per unit.</i>			
Unit			
Grocery store cost per unit			
Garden cost per unit			
Cost savings per unit			

Table 4. Vegetable Cost Table Example: Tomato

VEGETABLE COST TABLE			
Vegetable:	Tomato		
Description:	Grown in 2 raised beds, spring 2020.		
<i>List materials used to grow this vegetable only. Enter original cost and the number of years of gardening use before replacement. Calculate original cost ÷ use years = annual cost.</i>			
Direct Materials	Original Cost	Use Years	Annual Cost
Seedlings purchased	\$24.00	1.0	\$24.00
Tomato cages	\$40.00	4.0	\$10.00
Pest management	\$8.00	2.0	\$4.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
Total direct materials	\$72.00		\$38.00
<i>For materials that are used to grow more than one vegetable, add up costs in a shared cost table. Then enter the amount allocated to this vegetable here.</i>			
Shared Material Cost Allocations			Annual Allocation
Shared Cost Table 1			\$36.00
Shared Cost Table 2			\$0.00
Shared Cost Table 3			\$0.00
<i>Add the direct material annual costs and the shared material annual allocations to get the total annual material cost. Enter the harvest unit and amount harvested. Then calculate Total annual material cost ÷ Annual amount harvested = Total material cost per unit.</i>			
		Unit	Annual Totals
Total annual material cost	\$		\$74.00
Annual amount harvested		pound	50
Total material cost per unit	\$/pound		\$1.48

Table 5. Vegetable Cost Table Example: Baby Spinach

VEGETABLE COST TABLE			
Vegetable:	Baby Spinach		
Description:	Grown in 1 raised bed, winter 2019–2020		
<i>List materials used to grow this vegetable only. Enter original cost and the number of years of gardening use before replacement. Calculate original cost ÷ use years = annual cost.</i>			
Direct Materials	Original Cost	Use Years	Annual Cost
Seeds	\$5.00	1.0	\$5.00
Pest management	\$7.00	1.0	\$7.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
Total direct materials	\$12.00		\$12.00
<i>For materials that are used to grow more than one vegetable, add up costs in a shared cost table. Then enter the amount allocated to this vegetable here.</i>			
Shared Material Cost Allocations			Annual Allocation
Shared Cost Table 1			\$18.00
Shared Cost Table 2			\$0.00
Shared Cost Table 3			\$0.00
<i>Add the direct material annual costs and the shared material annual allocations to get the total annual material cost. Enter the harvest unit and amount harvested. Then calculate Total annual material cost ÷ Annual amount harvested = Total material cost per unit.</i>			
		Unit	Annual Totals
Total annual material cost		\$	\$30.00
Annual amount harvested		pound	9
Total material cost per unit		\$/pound	\$3.33

Table 6. Vegetable Cost Table Example: Carrot

VEGETABLE COST TABLE			
Vegetable:	Carrot		
Description:	Grown in 1 raised bed, winter 2019–2020		
<i>List materials used to grow this vegetable only. Enter original cost and the number of years of gardening use before replacement. Calculate original cost ÷ use years = annual cost.</i>			
Direct Materials	Original Cost	Use Years	Annual Cost
Seeds	\$6.00	1.0	\$6.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
Total direct materials	\$6.00		\$6.00
<i>For materials that are used to grow more than one vegetable, add up costs in a shared cost table. Then enter the amount allocated to this vegetable here.</i>			
Shared Material Cost Allocations			Annual Allocation
Shared Cost Table 1			\$18.00
Shared Cost Table 2			\$0.00
Shared Cost Table 3			\$0.00
<i>Add the direct material annual costs and the shared material annual allocations to get the total annual material cost. Enter the harvest unit and amount harvested. Then calculate Total annual material cost ÷ Annual amount harvested = Total material cost per unit.</i>			
		Unit	Annual Totals
Total annual material cost		\$	\$24.00
Annual amount harvested		pound	12
Total material cost per unit		\$/pound	\$2.00

Table 7. Shared Cost Table Example: Raised Beds

SHARED COST TABLE			
Cost Group Name:	Raised Beds		
Description:	Two raised beds, 4' x 8' each, 64 sq. ft. total. November 2019 through June 2020.		
<i>List materials used for this shared cost group. Enter original cost and the number of years of gardening use before replacement. Calculate original cost ÷ use years = annual cost.</i>			
Materials	Original Cost	Use Years	Annual Cost
Raised bed lumber and hardware	\$70.00	5.0	\$14.00
Raised bed soil	\$120.00	5.0	\$24.00
Annual soil amendment and fertilizer	\$18.00	1.0	\$18.00
Gardening tools and hose	\$104.00	8.0	\$13.00
Hose nozzle	\$12.00	4.0	\$3.00
			\$0.00
			\$0.00
			\$0.00
Total shared materials	\$324.00		\$72.00
<i>List the vegetables sharing this cost group. Enter the % allocation for each. For each vegetable, calculate % of Total (as a decimal) x Total shared material annual cost = Annual allocation.</i>			
Vegetables sharing this group	Square Feet	% of Total	Annual Allocation
Tomato	64	50%	\$36.00
Baby Spinach	32	25%	\$18.00
Carrot	32	25%	\$18.00
			\$0.00
			\$0.00
Total	128	100%	\$72.00

Table 8. Cost Savings Table Example

COST COMPARISON TABLE			
<i>For each vegetable, enter the unit, the grocery store cost per unit, and the garden cost per unit. Calculate Grocery store cost per unit - Garden cost per unit = Cost savings per unit.</i>			
	Tomato	Baby Spinach	Carrot
Unit	pound	pound	pound
Grocery store cost per unit	\$1.99	\$8.00	\$1.50
Garden cost per unit	\$1.48	\$3.33	\$2.00
Cost savings per unit	\$0.51	\$4.67	(\$0.50)