

## Introduction

Horticulture is part of the agricultural industry and is comprised of greenhouses, nurseries, flower cultivators, and other operations that grow nursery stock, flowers, or any crops that are grown under cover (i.e., in greenhouses). In 2022, data from the U.S. Census of Agriculture show that the horticulture industry in Pennsylvania sold just over \$1 billion in agricultural products, which was approximately 11 percent of all agricultural sales in Pennsylvania. In terms of sales, it is the fourth-largest agricultural industry in Pennsylvania, behind dairy (28 percent of sales), poultry and egg production (27 percent of sales), and oilseed and grain farming (11 percent of sales). This fact sheet presents findings from an economic impact analysis performed by the Center for Rural Pennsylvania on the Pennsylvania horticulture industry. Details on the methodology and definitions are provided in the Appendix.

## Key Findings Include:

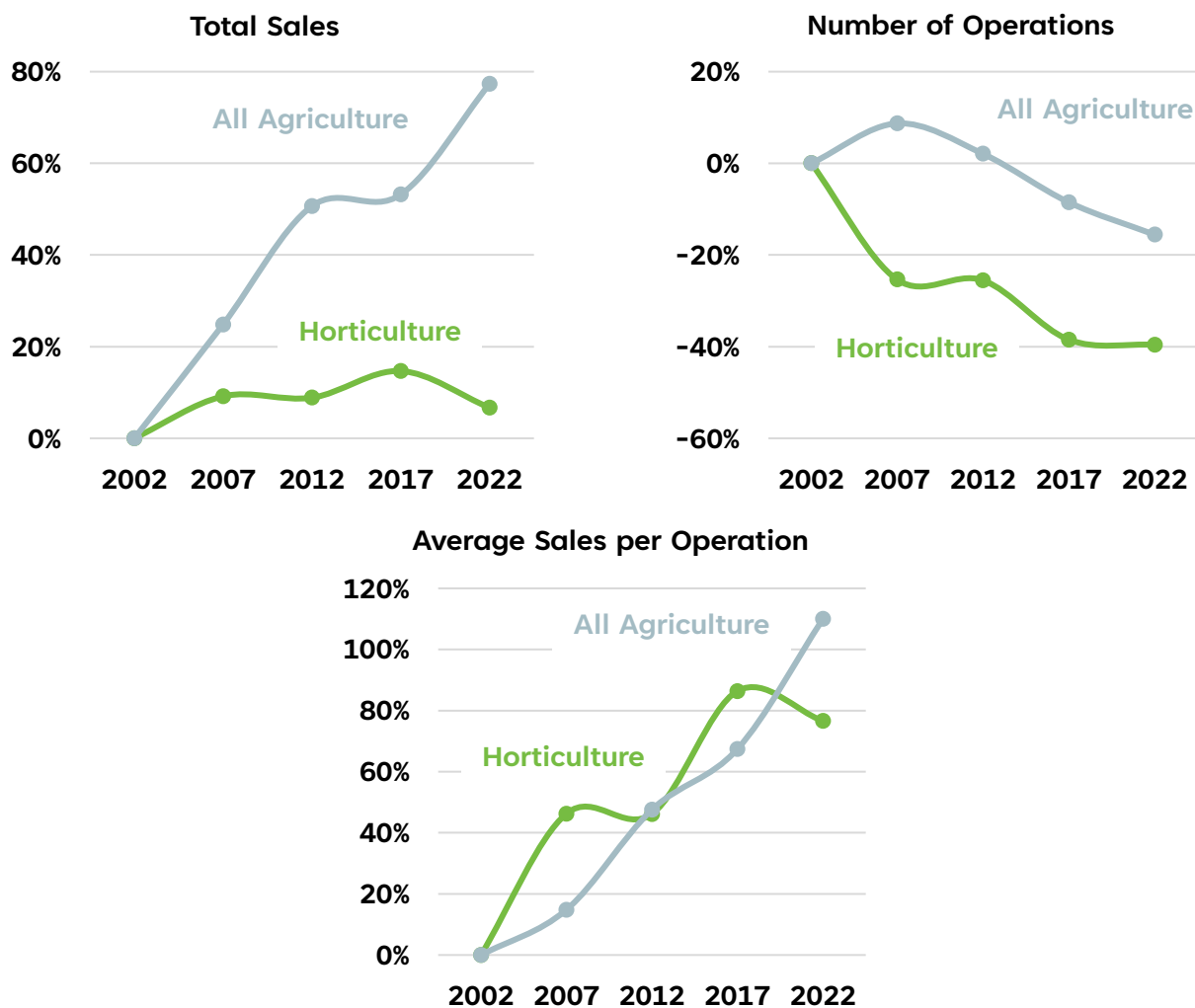
- Horticulture is the fourth-largest agricultural industry by sales in Pennsylvania, comprising 2,450 operations that generate anywhere from 11 to 18 percent of all sales of agricultural products sold each year within the Commonwealth.
- Like most agricultural operations in Pennsylvania, horticulture operations are primarily located in the southeastern portion of the state, led by Lancaster (236 operations) and Chester (174 operations) counties.
- The decline in the total number of agricultural operations since 2002 (-16 percent) has disproportionately affected the horticulture industry (-40 percent). However, horticulture operations tend to have higher average annual sales per farm (\$452,500 in 2022) than the rest of the agricultural industry (\$209,600 in 2022). This has been consistent over time.
- Horticulture operations spent \$390 million on labor in 2022. This amount represented the largest component of total expenditures (46 percent).
- For every dollar spent by a horticulture operation, it generates at least 86 additional cents within the Commonwealth, a large portion of which (83 percent) goes to other industries such as retail, health care, and other service sectors.
- Although horticulture operations located in urban areas (84 cents per dollar) generate a higher economic return than operations in rural areas (64 cents per dollar), rural horticulture operations support more jobs (5,200 rural jobs compared to 3,900 urban jobs).
- Over 60 percent of the jobs supported by the horticulture industry are unrelated to agriculture.



Figure 2 displays three line graphs comparing the change in the horticulture and agriculture industries for (1) total annual sales, (2) the number of operations, and (3) the average sales per operation. The data suggest that while sales in the horticulture industry lag the overall sales in agriculture (+7 percent versus +77 percent since 2002), this is likely attributable to the disproportionate decline in horticulture operations over time compared to other types of agricultural operations (-40 percent versus -16 percent since 2002).

However, despite the decline in operations over time, for 2022, the average horticulture operation brought in \$452,500 in annual sales, which was more than double the average annual sales for any agricultural operation in Pennsylvania (\$209,600). This trend also tracks historically, with the average sales per horticulture operation in a given year being double or triple the average sales per a typical farm operation.

**Figure 2: Percent Change Since 2002 in Total Sales, Number of Operations, and Average Annual Sales per Operation, Horticulture vs. All Pennsylvania Agriculture**



Note: Sales figures adjusted for inflation (CPI-U=2022).

Source: U.S. Census of Agriculture.

The U.S. Census of Agriculture collects and publishes data on production expenses incurred by farm operations in order to maintain their businesses. Table 1 lists the total production expenses incurred by Pennsylvania horticulture operations in 2022 by category of expense. As is the case for many agricultural operations, labor is the primary production expense, comprising 46 percent of total costs. Most of those expenses went to hired laborers (95 percent), who were paid an average of \$23,100 that year.

**Table 1: Production Expenses for the Horticulture Industry in Pennsylvania, 2022**

	Amount (\$M)	Percent
<b>All Production Expenses</b>	<b>\$847.9</b>	<b>100%</b>
Labor (Includes Contract Labor)	\$390.4	46%
Chemicals (Includes Fertilizer)	\$145.3	17%
Building and Land Maintenance	\$120.1	14%
Seeds, Plants, and Vines	\$92.0	11%
Transportation Expenses	\$38.4	5%
Other Expenses	\$61.6	7%

*Source: U.S. Census of Agriculture.*

**Economic Impact**

Using the IMPLAN economic modeling application, operation expenses from the 2022 U.S. Census of Agriculture were categorized into appropriate commodity and industry codes.<sup>1</sup> The application is one of the most widely used impact models in academic and professional research and utilizes publicly available data to generate results. Table 2 summarizes the results for this analysis, which are categorized into direct, indirect, and induced impacts.

Direct impacts are the initial changes that result from the spending by the horticulture operation (e.g., the money a farmer pays to a supplier who provides fertilizer), while indirect effects are the ripple effects of business-to-business purchases in the supply chain that result from the spending (e.g., the fertilizer supplier spends the operation’s money on additional purchases of raw materials). Induced impacts stem from horticulture workers spending their earned income within the wider economy. In other words, when laborers make money from work on the operations, they then in turn spend it on the local economy, which extends the impact of the horticulture industry to many other, seemingly unrelated industries. See the Definitions and Methodology sections in the Appendix for more details.

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<sup>1</sup> See the Appendix for details on IMPLAN and the methodology used in the analysis.

**Table 2: Economic Impact of Pennsylvania’s Horticulture Industry in 2024  
Dollars, Operations Located in Rural vs. Urban Pennsylvania**

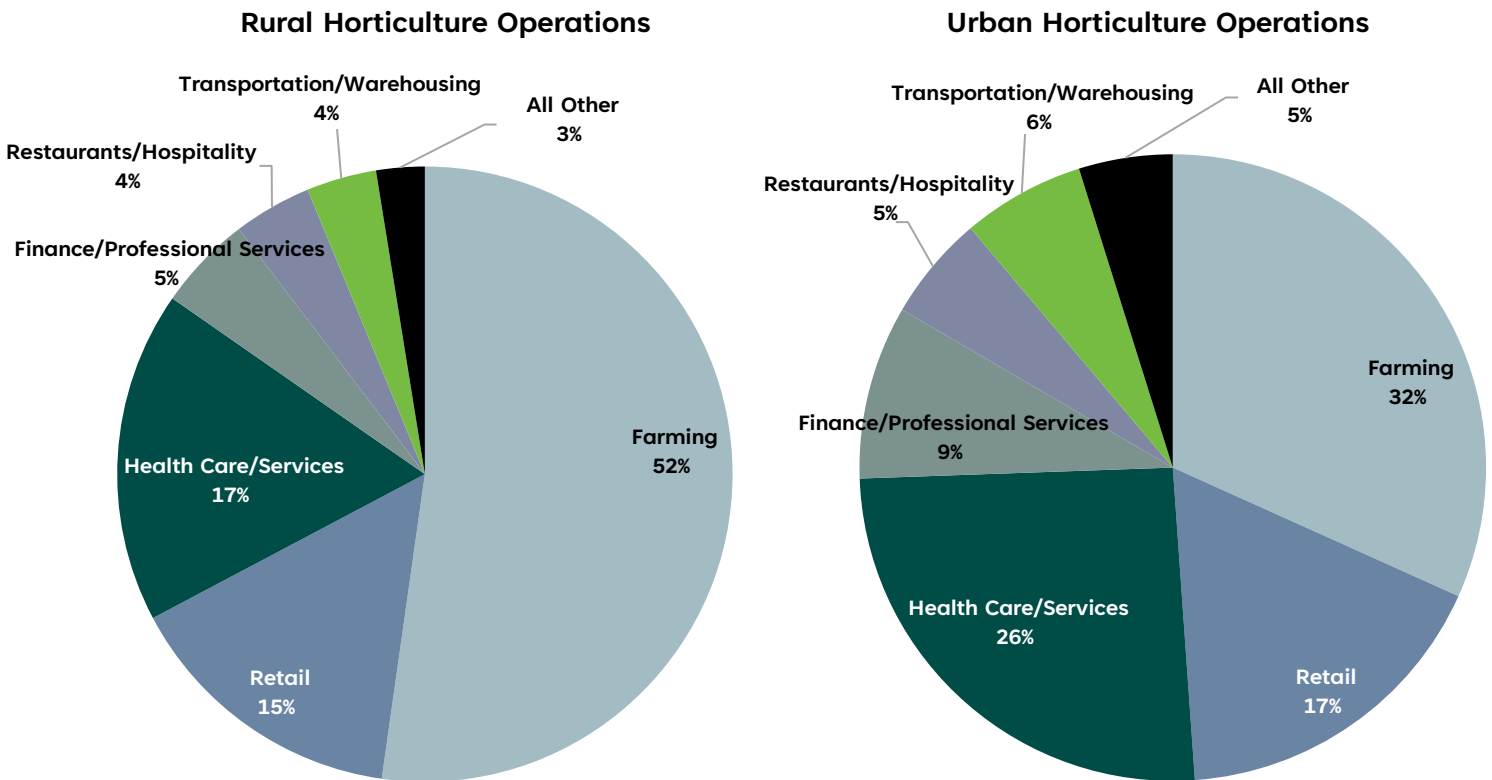
	Direct	Indirect	Induced	Total Annual Impact
<b>Rural Pennsylvania</b>				
Total Economic Impact (\$M)	\$135.1	\$20.1	\$139.4	<b>\$294.5</b>
Jobs Supported	3,400	200	1,600	<b>5,200</b>
<b>Urban Pennsylvania</b>				
Total Economic Impact (\$M)	\$114.9	\$29.7	\$183.5	<b>\$328.1</b>
Jobs Supported	2,000	200	1,700	<b>3,900</b>

*Note: Impacts under Rural and Urban Pennsylvania were performed under two separate analyses and should not be added together for a total statewide impact.  
Source: Economic impact analysis performed via IMPLAN by the Center for Rural Pennsylvania using 2022 data from the U.S. Census of Agriculture.*

Although the return on investment for rural areas (64 cents per dollar spent) is lower than that for urban areas (84 cents per dollar spent), the results indicate that roughly 1,300 more jobs are supported by the industry in rural areas as compared to urban areas. Statewide, it is estimated that the industry generates an economic return of about 86 cents per dollar that a horticulture operation spends to maintain its business (not shown).

Figure 3 displays two charts that detail the industries of the total jobs supported (includes direct, indirect, and induced jobs) by the horticulture industry for rural and urban Pennsylvania. In general, while horticulture supports similar types of jobs for both rural and urban counties, the industry tends to support more farming jobs in rural areas. The impacts on jobs in urban counties cover a greater variety of industries, with nearly 70 percent of the supported jobs being unrelated to the agricultural industry (60 percent statewide). This likely explains the higher return on investment in these areas, as economic activity moving to different industries that historically generate more returns for the local economy (e.g., transportation, professional services) generally results in a higher impact value. Moreover, some of the economic benefits may stem from purchases by rural operations from suppliers in urban counties. In other words, the economic activity may be performed by rural businesses but flows to urban areas due to the availability of supplies. Since the analysis is based off the expenses incurred by horticulture operations, rural producers may be forced to obtain needed supplies from further away in more populous regions of the Commonwealth, thus further bolstering urban economies.

**Figure 3: Industries Supported by Pennsylvania’s Horticulture Industry, Operations Located in Rural vs. Urban Areas**



Source: Economic impact analysis performed via IMPLAN by the Center for Rural Pennsylvania using 2022 data from the U.S. Census of Agriculture.

## Conclusion

The analysis shows that the horticulture industry is a major job supporter for rural counties, primarily in supply-chain agricultural industries, such as businesses that provide soil preparation, crop harvesting, tree planting, and other similar services to agricultural operations. For urban counties, nearly 70 percent of the jobs supported and about 85 percent of the economic value added to the economy were in industries unrelated to agriculture, not only highlighting that the industry is important to agriculture in general but also the overall statewide economy.

However, most important to note is that these estimates of return on investment likely represent a lower bound for two main reasons: (1) to avoid double counting, the analysis excludes the impact of generated sales, and (2) the NAICS-level data from the U.S. Census of Agriculture used in the analysis only represent operations that primarily sell horticulture products, excluding production and sales from operations where horticulture is only a minor component. Another technical factor is that property and other taxes could not be included in the analysis because they are transfer payments and do not flow directly into the private economy. However, these taxes are received by local governments as revenues to support various public programs, which may contribute to overall quality of life in the areas where these horticulture operations are located. Therefore, the true impact of the horticulture industry is greater than what is displayed in this report.

## Appendix

### Definitions:

- A **horticulture operation** is an agricultural operation where the primary products sold were under industry code NAICS 1114, as defined by the U.S. Census of Agriculture. Note that there may be other operations that sold products under industry code NAICS 1114 but are not classified as a horticulture operation due to not having these sales as their primary revenue generator.
- The rural and urban classifications are based on the statewide population density of 291 persons per square mile. A county defined as **rural** has less than 291 persons per square mile, while a county defined as **urban** has more than 291 persons per square mile.
- **Total economic impact** is the amount of economic activity generated by the horticulture industry. Within IMPLAN, this is referred to as the value added to the region's economy and is a measure of the industry's contribution to gross domestic product (GDP).
- The figure for **jobs supported** represents the average annual employment of full-time, part-time, and seasonal workers.
- **Direct impacts** represent the initial changes that result from an economic event. In the case of economic value, the direct impact is akin to GDP. In terms of jobs supported, it represents the number of jobs supported solely within the horticulture industry.

- The **indirect impacts** are the ripple effects of business-to-business purchases in the supply chain that result from the economic event. For economic value, indirect impacts are associated with the economic activity surrounding business-to-business transactions. For jobs supported, it represents the jobs required to sustain the supply of goods and services to businesses in the horticulture industry.
- **Induced impacts** stem from household spending of labor income supported by the horticulture industry. In other words, as laborers earn income from work on the operations, they then spend it on the local economy, which extends the impact to seemingly unrelated industries. The total economic impact in this case represents the business activity that responds to income being spent in the region by horticulture workers, while the jobs supported are the additional workers needed to sustain the businesses that support the horticulture worker population.
- The **return on investment** is calculated by taking the total economic impact and dividing it by the amount of initial spending incurred by the horticulture industry.

Methodology:

This economic impact analysis was performed using IMPLAN, an input-output modeling application that quantifies the economic impact of specified events utilizing databases, economic factors, multipliers (economic returns derived from spending patterns), and demographics. Inputs were pulled from the 2022 U.S. Census of Agriculture, but the outputs represent 2024 dollars.

Unlike traditional economic impact analyses, which input gross revenues into the model, this analysis instead inputs industry expenditures. This is because most agricultural operations in the Commonwealth produce little to no profit, and many are classified as “hobby farms,” where the goal of producers is not to make a profit, but rather, for personal or recreational enjoyment. In order to effectively measure the economic impact of these small farms, it is important to consider the supply chain effects that result from purchases of goods and services for the purpose of maintaining the industry. These purchases reverberate throughout the economy and result in significant economic returns, even if the operation does not sell enough product to make a profit. The data show that 86 percent of horticulture operations generate less than \$250,000 in annual sales (classifying them as small), which is in line with all agricultural operations (85 percent). Therefore, it is appropriate to perform an economic impact analysis on this industry based on expenditures instead of revenues, given most of them are likely not generating sufficient revenue to remain profitable.

Expenditure data for Pennsylvania horticulture operations was pulled from the 2022 U.S. Census of Agriculture and categorized into appropriate IMPLAN commodity (goods purchased) and industry (services purchased) codes. Expenditures solely under horticulture operations were not available at the county level, so to calculate the rural and urban distinctions, total expenditures for all farm operations were used instead to approximate different agricultural spending profiles for rural and urban areas. For



example, rural operations tended to spend more on gasoline and other types of fuels, while urban areas tended to spend more on contract labor.

Once the model was established, the rural and urban spending profiles were each run through IMPLAN separately to produce the direct, indirect, and induced figures shown in the report. The return on investment calculations represent the total value of economic impact for each dollar spent by these horticulture operations. In other words, for every dollar spent in the horticulture industry, it generates a certain amount of economic growth or return. The metric is calculated by taking the total economic impact figure (2022 data in 2024 dollars) and dividing it by the total value of what the industry spent on a service or commodity in 2022, based on the U.S. Census of Agriculture data.

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