

The Economic Contribution of the Indiana Green Industry

Ariana Torres

Purdue Horticulture Business — hort.purdue.edu/HortBusiness

Purdue Horticulture and Landscape Architecture — ag.purdue.edu/HLA

Purdue Agricultural Economics — ag.purdue.edu/AgEcon

Alan Hodges

University of Florida Food and Resource Economics Department — fred.ifas.ufl.edu



Analysts expect the demand for garden and nursery products to increase as household incomes increase. Green industry research reports from IBISWorld (2016, 2017), one of the world's leading publishers of business intelligence, predict that higher household income will likely increase the value of residential and nonresidential construction for the next five years. Higher incomes will also increase the demand for ornamental plants from florists, retail nurseries, and garden centers.

Indiana Green Industry Facts

- 6th ranked agricultural commodity in the state
- 4th ranked state in the Midwest in jobs and added value
- \$3.524 billion in total output impact
 - \$2.542 billion in direct output
 - \$981 million in indirect/induced output
- 39,260 full-time and part-time jobs
 - 31,798 direct jobs
 - 7,463 indirect/induced jobs
- \$2.113 billion in value added impact
 - \$1.423 billion in labor income impact
 - \$499 million in other property impact
 - \$191 million in tax on production and imports impact

Put simply, when consumers have more disposable income, they will purchase more plants, and homeowners are more likely to engage in new projects for their yards and gardens. These trends present important economic opportunities for the environmental horticulture or green industry.

Researchers at Texas A&M University, University of Tennessee, and University of Florida defined green industry businesses as businesses that produce and use landscape

and floral crops and related supplies and equipment (Hall et al., 2016). Green industry businesses are also engaged in the design, construction, and maintenance of landscapes. In this publication, we categorize the green industry in five distinct sectors based on the business' main revenue activity:

1. Crop production
2. Lawn and garden equipment manufacturing
3. Landscape and horticultural services
4. Wholesale trade
5. Retail trade

This publication estimates the economic contributions of Indiana's green industry in these five sectors. Table 1 describes in more detail the business categories used in this publication.

Table 1. Green industry categories and types of businesses.

BUSINESS CATEGORY	TYPE OF BUSINESS
Crop production	<ul style="list-style-type: none"> • Greenhouse, nursery, and floriculture production (including sod farms)
Lawn and garden equipment manufacturing	<ul style="list-style-type: none"> • Lawn and garden equipment manufacturing
Landscape services ¹	<ul style="list-style-type: none"> • Landscape and horticultural services • Landscape architectural services
Wholesale trade	<ul style="list-style-type: none"> • Farm and garden equipment merchant wholesalers • Nursery and florist merchant wholesalers
Retail trade	<ul style="list-style-type: none"> • Lawn and garden equipment and supplies stores • Florists • Food and beverage stores with floral sales, lawn, and garden sales • Gasoline stores with floral sales, lawn, and garden sales • General merchandise stores with floral sales, lawn, and garden sales • Non-store retailers with floral sales, lawn, and garden sales, (mail and internet orders)

¹ See the US Census Bureau North American Industry Classification System (NAICS) for a complete list of landscape services businesses (www.census.gov/cgi-bin/sssd/naics/naicsrch?code=561730&search=2017%20NAICS%20Search) and landscape architectural services (www.census.gov/cgi-bin/sssd/naics/naicsrch?code=541320&search=2017%20NAICS%20Search). Landscape services businesses do not include golf courses. The Census Bureau classifies golf courses under another category: Other Amusement and Recreation Services.

Data and Methods

For this publication, we used data from the Impact Analysis for Planning (IMPLAN) economic model and databases for 2013 (Implan Group LLC, 2015). The IMPLAN model uses data available from a variety of sources, including the Census of Agriculture, the Economic Census, the Quarterly Census of Employment and Wages, and state and national gross domestic product (GDP) and personal income statistics. IMPLAN aggregates the data to estimate the industry-specific effect on the local economy of changes in activity or existing activities for a given year.

The Green Industry Research Consortium of economists and horticulturalists originally estimated these effects. The consortium is organized as a multi-state project that has been tracking nursery and greenhouse industry businesses since 1989. More information about the green industry impact assessment for the United States is available in "Economic Contributions of the Green Industry in the United States, 2013" (Hodges et al., 2015).

Green Industry Contributions in Indiana

In 2013, Indiana’s green industry generated approximately \$2.542 billion in sales (direct output) and employed 31,798 direct full-time and part-time workers.

IMPLAN estimates show that Indiana’s green industry sales represented a fraction of the Midwest (9.20 percent) and overall U.S. green industry sales (1.86 percent). Indiana’s Midwest and national share of employment account for similar percentages.

At the national level, the green industry generated \$136.438 billion in direct output and 1.600 million direct full-time and part-time jobs in 2013.

The total output variable measures the total value of sales of the green industry and other related industries in the overall Indiana economy. Total output represents the total value of sales that occur throughout the supply chain of the green industry. An exception is that output for retailer and wholesaler establishments represent the sales minus the cost of goods sold — this avoids double counting sales from producers. The total output variable aggregates the value of direct, indirect, and induced output. The direct output variable calculates the value of industry sales by green industry businesses (except for retailers, which represents sales minus the cost of goods sold). Table 2 describes the variables that measure the economic impact of the Indiana green industry.

Table 2. Economic impact variables of the green Industry in Indiana.

IMPLAN VARIABLE	VARIABLE DESCRIPTION
Total output impact	This variable calculates the value of sales of the green industry and other related industries in the overall Indiana economy. It is the sum of the direct, indirect, and induced outputs described below.
Direct output	This variable calculates the value of industry sales by green industry businesses (except for retailers, which represents sales minus the cost of goods sold).
Indirect output	This variable calculates the value of sales the green industry generates in supply chain industries in the Indiana economy. For example, the sales of inorganic chemical manufacturing industries that supply pesticides and herbicides.
Induced output	This variable calculates the sum of local household purchases per dollar of output based on labor income payments made by the green industry and local supply chain industries from which they purchase.
Total employment impact	This variable reports the number of full-time and part-time jobs in the green industry and other industries in the Indiana economy. It is the sum of direct and indirect/induced employment.
Direct employment	This variable reports the number of full-time and part-time jobs in the green industry.
Indirect/Induced employment	This variable reports the number of full- and part-time jobs generated in other industries because of green industry activity.
Value added impact	This variable calculates the value of sales (output) minus the value of intermediate purchases of goods and services from other sectors in the overall economy. Value added is comparable to the Gross Domestic Product (GDP). Value added also represents the sum of labor income impact, other property impact, and tax on production and imports impact.
Labor income impact	This variable calculates employee wages, salaries, benefits, and proprietor income generated in all sectors of the economy.
Other property impact	This variable calculates rents, interest, royalties, and corporate dividends generated in the economy.
Tax on production and imports impact	This variable calculates the taxes green industry activities paid to local, state, and federal governments.

In addition to the direct economic contributions, we calculated the green industry’s effect on the overall Indiana economy by using IMPLAN multipliers. These multipliers estimate how much every dollar of output to final demand from the green industry is multiplied in the local economy.

For example, a multiplier of 1.39 means that for each dollar of output in the green industry, \$1.39 of output is generated in Indiana: the dollar in the industry (direct output) plus an additional \$0.39 in related industries (indirect/induced output). The job multiplier for the green industry is 1.23. In other words, every direct job supported in the green industry creates 1.23 jobs in the total economy — the original job (direct employment) in the green industry plus 0.23 additional jobs in other industries (indirect/induced employment).

In this analysis, domestic and international exports or shipments outside Indiana were considered as new final demand and subject to the total multiplier effects, while sales in-state were treated only as direct multiplier effects.

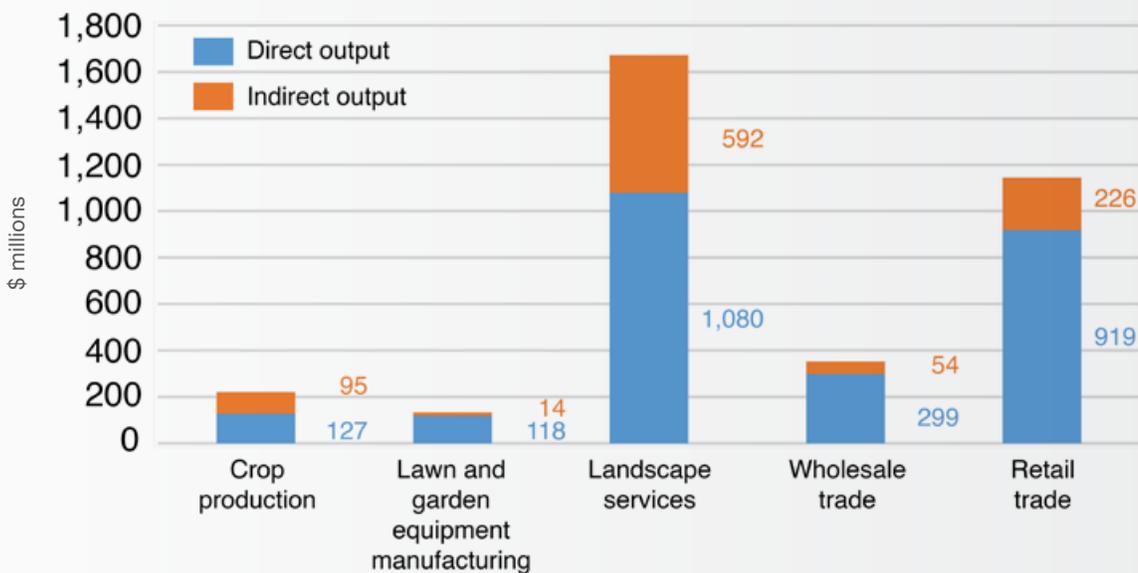
The estimated total economic contributions of the Indiana green industry include \$3.524 billion in total output, 39,260 total jobs, and \$2.113 billion in value added impact.

Not All Green Industry Businesses Are Equal

Green industry sectors are vastly different in size. Figure 1 illustrates the direct output and indirect/induced output of the different groups of businesses in the industry (crop production, lawn and garden equipment manufacturing, landscape services, wholesale trade, and retail trade).

The three business sectors that generated the most direct and indirect/induced output include landscape services, retail trade, and wholesale trade. Together, landscape services, retail trade, and wholesale trade generated about 90 percent of the Indiana green industry output in 2013. The other 10 percent was generated by the crop production sector (\$127 million in direct output) and lawn and garden equipment and manufacturing (\$118 million in direct output).

Figure 1. Indiana green industry group output impacts, 2013.



Of the total \$3.524 billion in total output, landscape services generated \$1.672 billion in total output impact —\$1.080 billion in direct output and \$592 million in indirect/induced output.

Landscape services businesses are engaged in landscape and horticultural services and landscape architectural services. The retail trade group generated \$1.145 billion in total output impact, which includes \$919 million in direct output and \$226 million in indirect/induced output.

Businesses in the retail trade category include lawn and garden supplies stores, florists, mail and internet sales retailers, home improvement centers (such as big box stores like Home Depot), and various other retailers with small green goods sections (such as food stores and gasoline stations).

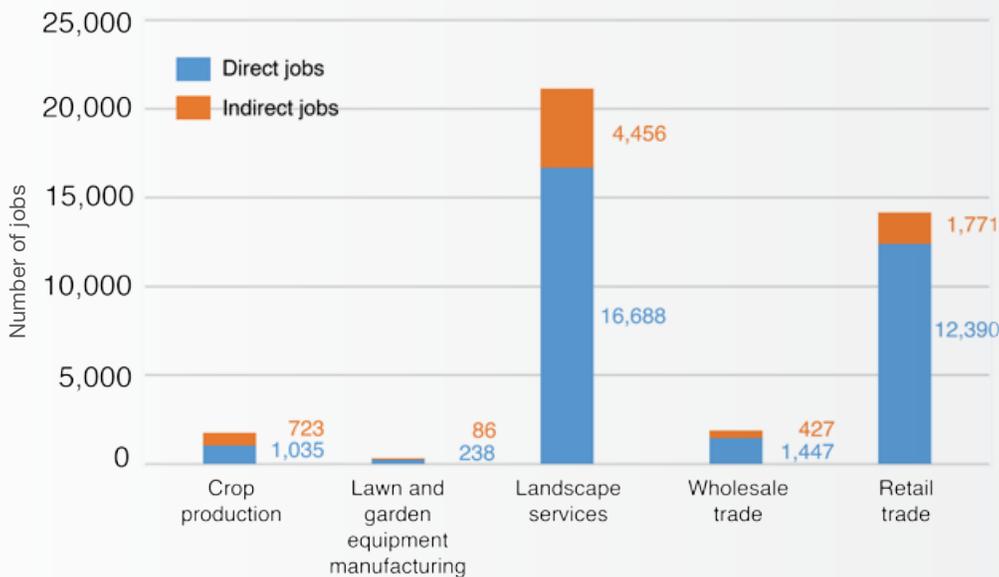
Lastly, the wholesale trade sector generated \$353 million in total output impact, which includes \$299 million in direct output and \$54 million in indirect/induced output.

Wholesale establishments include farm and garden equipment wholesalers and nursery and florist wholesalers.

The Indiana green industry generated a total of 39,260 full-time and part-time positions in 2013, including 31,978 direct jobs in the green industry and 7,463 jobs in other sectors (indirect/induced jobs). Figure 2 illustrates the job creation by green industry groups.

Similar to sales, landscape services and retail trade sectors had the greatest impact on job creation by supporting 92 percent of industry jobs. Landscape services supported 16,688 direct employees (52 percent), while retailers employed 12,390 individuals (39 percent). Jobs generated outside the industry by landscape services and retail trade accounted for 53 percent (4,456) and 39 percent (1,771), respectively.

Figure 2. Indiana green industry employment impacts, 2013.



Data from the 2014 Green Industry Research Consortium survey reports employment trends for 2001-2013 in Indiana. It reports that employment increased for landscape architectural services business by 81 percent, farm and garden equipment wholesalers by 6 percent, and lawn and garden equipment and supplies stores by 1 percent. On the other hand, employment declined in businesses such as lawn and garden equipment

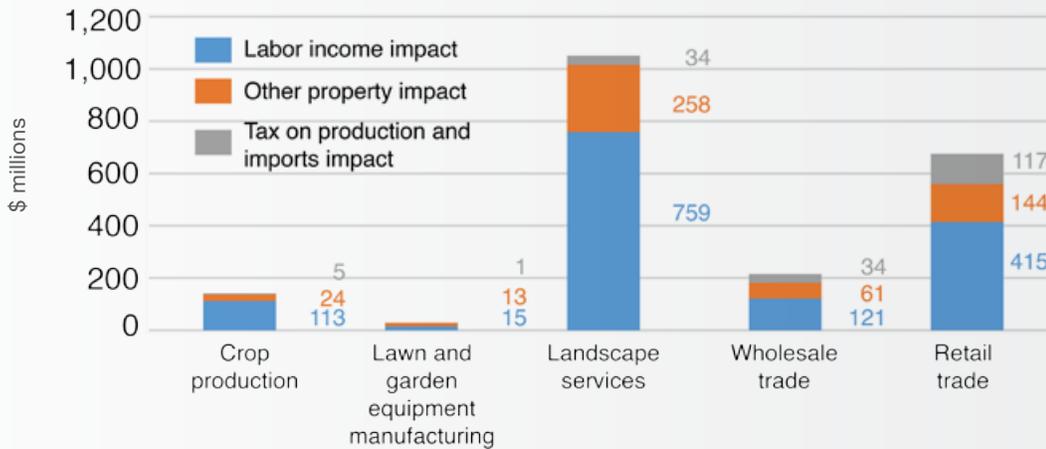
manufacturing (-57 percent) and nursery and florist wholesalers (-11 percent) during the 2001-2013 period.

The Indiana green industry generated \$2.113 billion in value added contribution to GDP in 2013. Value added contributions represent the value of sales minus intermediate purchases of goods and services from other sectors generated in the overall economy. Value added is comparable to GDP (Table 2).

Similar to the trends in output and job creation, the largest sectors for GDP impacts were landscape services (\$1.051 billion), retail trade (\$676 million), and wholesale trade (\$216 million). Together, these sectors captured almost 92 percent of the value added impact in the Indiana economy. Further, we can break down the industry value added contribution in labor income (\$1.423 billion), other property (\$499 million), and tax on production and imports (\$191 million).

Figure 3 illustrates the contribution of each businesses category to the value added contribution. Similar to output and employment, landscape services, and retail trade had the greatest impacts on each value added category. For instance, businesses in landscape services had the greatest impact on labor income (\$759 million) and other property (\$258 million), while retail trade had the greatest impact on the amount taxed on production and imports (\$117 million), likely due to sales taxes levied at the retail level.

Figure 3. Indiana green industry value added impact, 2013.



Conclusions

This publication shows that landscape services, retail, and wholesale trade are the top three green industry businesses contributing to the Indiana economy in terms of output, jobs, and value added. Together, these businesses generated 90 percent of total output, 95 percent of total jobs created, and 92 percent of total value added impact.

The Indiana green industry contributions to direct output, direct employment, and added value ranked fifth, fourth, and fourth, respectively, when compared to Illinois (largest direct output, jobs, and added value contributions), Ohio, Michigan, Minnesota, Missouri, and Iowa (Hodges et al., 2015). The Indiana green industry had a GDP contribution (value added) of \$2.113 billion in 2013. This contribution represented 0.67 percent of the total Indiana GDP.



In relative terms, green industry businesses generated \$322 per person (GDP per capita), about \$50 less than the Midwest average and \$60 less than the U.S. average (Hodges et al., 2015). Compared to other Midwest states, the Indiana green industry ranked seventh in terms of GDP per capita contributions after Wisconsin (\$457/person), Illinois (\$388/person), Ohio (\$383/person), Minnesota (\$381/person), Michigan (\$372/person), and Iowa (\$353/person), but higher than Missouri (\$294/person).

The 2012 Census of Agriculture reported that the nursery and floriculture crop industries (including sod farms) in Indiana comprised 888 operations that generated about \$110.8 million in direct sales. Their market value was ranked sixth after grains, oilseeds, dry beans, and dry peas (\$7.218 billion); hogs and pigs (\$1.273 billion); poultry and eggs (\$1.164 billion); milk (\$659.314 million); and cattle and calves (\$522.694 million).

On the other hand, the nursery, greenhouse, floriculture, and sod industries ranked higher than vegetables, melons, potatoes, and sweet potatoes (\$104.411 million); other crops and hay (\$76.467 million); horses, ponies, mules, burros and donkeys (\$23.899 million); other animals and other animal products (\$22.297 million); fruits, tree nuts, and berries; sheep, goats, wool, mohair, and milk (\$10.897 million); tobacco (\$7.653 million); aquaculture (\$5.120 million); cut Christmas tree and short rotation woody crops (\$1.976 million); and cotton and cottonseed (not published).

This information provides evidence of the linkages of the green industry with other industries within the state. Green industry businesses bring money to the state, create new jobs, and help diversify the economic base of Indiana. As the economy keeps recovering from the latest recession and as new opportunities arise for green industry businesses, data from this publication can be used to design policies that promote the development of the green industry and increase its contribution to the Indiana economy. Businesses, industry leaders, Extension personnel, researchers, and government officials can use this information to understand the contribution of the industry on the overall Indiana economy.

REFERENCES

IBISWorld. (2016). *Plant & Flower Growing in the US*, May 2016.

IBISWorld. (2016). *Nursery & Garden Stores in the US*, October 2016.

IBISWorld. (2017). *Landscaping Services in the US*, March 2017.

Hall, C. R., Hodges, A. W., & Haydu, J. J. (2006). The Economic Impact of the Green Industry in the United States. *HortTechnology*, 16(2): 345-353.

Hodges, A. W., Hall, C. R., Palma, M. A., & Khachatryan, H. (2015). Economic Contributions of the Green Industry in the United States in 2013. *HortTechnology*, 25(6): 805-814.

IMPLAN (2015). *Software for Economic Impact Analysis and Social Accounting and 2013 Economic Data for The State of Indiana*. Implan Group, LLC, Huntersville, NC.

Reference in this publication to any specific commercial product, process, or service, or the use of any trade, firm, or corporation name is for general informational purposes only and does not constitute an endorsement, recommendation, or certification of any kind by Purdue Extension. Individuals using such products assume responsibility for their use in accordance with current directions of the manufacturer.