

Economic Impacts of the Green Industry in the United States

Final Report to the National Urban and Community Forestry Advisory Committee

by

Charles R. Hall, PhD, University of Tennessee
2621 Morgan Circle Room 314B, Knoxville, TN 37996
crh@utk.edu

Alan W. Hodges, PhD, University of Florida
PO Box 110240, Gainesville, FL 32611
awhodges@ufl.edu

John J. Haydu, PhD, University of Florida
2725 Binion Rd, Apopka, FL 32703
jjh@ifas.ufl.edu

Revised June 3, 2005

Acknowledgements

This research report was made possible by a grant from USDA-Forest Service, *National Urban and Community Forestry Advisory Committee*, along with funding from the American Nursery and Landscape Association (ANLA) and the Associated Landscape Contractors of America (formerly ALCA, now PLANET – the Professional Landcare Network). Others who contributed to the effort by providing information or technical reviews included John Brooker (University of Tennessee), David Mulkey and Tom Stevens (University of Florida), Jennifer Dennis (Purdue University), and members of the Green Industry Research Consortium (S-290 Multi-State Research Committee of USDA-CSREES).

Table of Contents

List of Figures and Tables.....	iv
Glossary of Economic Impact Terms	vi
Executive Summary	1
1. Background and Introduction	5
Green Industry Structure.....	6
Input Supply Firms	6
Production Firms.....	6
Wholesale Distribution Firms	8
Horticultural Service Firms.....	8
Retailers	9
End Users	9
Current Green Industry Situation.....	10
Nursery and Greenhouse Growers.....	10
U.S. Ornamental Imports	12
Lawn and Garden Equipment	13
Horticultural Service Firms.....	13
Green Industry Outlook	14
Consumer Trends.....	15
Producer Challenges	15
Structural Impacts on the Industry.....	16
Previous Economic Impact Studies	17
2. Research Methodology	21
Industry Sector Classification.....	21
Information Sources.....	21
Economic Impact Analysis.....	23
3. Results for All Sectors	26
National Results.....	26
State and Regional Results	27
4. Results for Production and Manufacturing Sectors	40
Nursery and Greenhouse Sector	41
Lawn and Garden Equipment and Greenhouse Manufacturing Sectors.....	42
5. Results for the Horticultural Service Sectors.....	46

Landscape Services.....	48
Landscape Architecture	48
6. Results for the Wholesale and Retail Trade Sectors.....	51
Wholesale Flower, Nursery Stock & Florist Supply	52
Wholesale Lawn & Garden Equipment Distributors.....	52
Retail Lawn and Garden Supply Stores.....	53
Retail Building Materials and Supply Stores.....	53
Florists	53
Retail Food and Beverage Stores.....	53
Retail General Merchandise Stores	54
7. Economic Impacts of Urban Forestry	62
Economic Impacts of Tree Sales and Tree Care Services	62
Other Economic Benefits of Urban Forestry	64
8. Literature and Information Sources Cited.....	68
Appendix A--Economic Multipliers for the U.S. Green Industry Sectors.....	72

List of Figures and Tables

Table ES-1. Summary of Economic Impacts of the U.S. Green Industry by Sector, 2002	2
Figure ES-1. Output Impacts of the U.S. Green Industry, by Region and Industry Group, 2002	2
Table ES-2. Economic Impacts of the U.S. Green Industry by Region/State and Industry Group, 2002 ..	3
Figure ES-2. Employment Impacts of the U.S. Green Industry, by Region and Industry Group, 2002	4
Table 1-1. U.S. Households Purchasing Lawn and Garden Products, By Type of Outlet, 2003	9
Figure 1-1. Growth in Output of US Green Industry Sectors, 1987-2003.....	10
Table 1-2. Summary of Selected Recent Studies on Economic Impacts of the Green Industry in Individual States.....	19
Table 1-3. State-Specific Studies of Economic Impacts of the Green Industry, 1978-2004.....	20
Table 2-1. Classification of Economic Sectors Associated with the Green Industry	21
Table 2-2. Sales and Employment in the U.S. Green Industry, 2002	22
Table 2-3. <i>Implan</i> Sectors Used for Economic Impact Analysis of the Green Industry	24
Figure 2-1. Market Structure and Economic Linkages of the Green Industry.....	24
Table 2-4. Output Total Effects Multipliers for the Green Industry, by Sector and State (2001).....	25
Table 3-1. Economic Impacts of the U.S. Green Industry, by Sector, 2002.....	26
Table 3-2. Economic Impacts of the U.S. Green Industry by State/Region and Industry Group, 2002...	27
Figure 3-1. Output Impacts of the U.S. Green Industry by Region and Industry Group, 2002.....	29
Figure 3-2. Employment Impacts of the U.S. Green Industry by Region and Industry Group, 2002	29
Figure 3-3. Value added Impacts of the U.S. Green Industry by Region and Industry Group, 2002.....	30
Table 3-3. Output Impacts of the U.S. Green Industry by Sector and State, 2002	31
Figure 3-4. Output Impacts of the U.S. Green Industry by State and Industry Group, 2002	32
Table 3-4. Employment Impacts of the U.S. Green Industry by Sector and State, 2002	33
Figure 3-5. Employment Impacts of the U.S. Green Industry by State and Industry Group, 2002.....	34
Table 3-5. Value Added Impacts of the U.S. Green Industry by Sector and State, 2002.....	35
Figure 3-6. Value Added Impacts of the U.S. Green Industry by State and Industry Group, 2002	36
Figure 3-7. Output Impacts of the U.S. Green Industry in Leading States, 2002.....	37
Figure 3-8. Employment Impacts of the U.S. Green Industry in Leading States, 2002	37
Figure 3-9. Value Added Impacts of the U.S. Green Industry in Leading States, 2002.....	38
Figure 3-10. Rank Order of States by Green Industry Share of Gross State Product, 2002.....	38
Table 3-6. Green Industry Share of Gross State Product, 2002.....	39
Table 4-1. Products Included in the Production and Manufacturing Sectors of the Green Industry	40
Table 4-2. Establishments, Employment, Payroll and Sales in Production and Manufacturing Sectors of the U.S. Green Industry, 2002	41
Table 4-3. Economic Impacts of the Production and Manufacturing Sectors of the U.S. Green Industry, 2002.....	41
Table 4-4. Economic Impacts of the U.S. Nursery and Greenhouse Sector by State, 2002	43

Table 4-5. Economic Impacts of the U.S. Lawn & Garden Equipment Manufacturing Sector by State, 2002.....	44
Table 4.6. Economic Impacts of the U.S. Greenhouse Manufacturing Sector by State, 2002	45
Table 5-1. Specialties for Horticultural Service Firms	46
Table 5-2. Sales and Employment in the U.S. Horticultural Services Sectors, 2002	47
Table 5-3. Economic Impacts of the U.S. Horticultural Services Sectors, 2002.....	48
Table 5-4. Economic Impacts of the U.S. Landscaping Services Sector by State, 2002.....	49
Table 5-5. Economic Impacts of the U.S. Landscape Architecture Sector by State, 2002.....	50
Table 6-1. Output, Employment and Payroll in the U.S. Environmental Horticulture Wholesale and Retail Trade Sectors, 2002.....	51
Table 6-2. Economic Impacts of the U.S. Environmental Horticulture Wholesale and Retail Trade Sectors, 2002.....	52
Table 6-3. Economic Impacts of the U.S. Wholesale Flower, Nursery Stock & Florist Supply Sector by State, 2002.....	55
Table 6-4. Economic Impacts of the U.S. Wholesale Lawn & Garden Equipment Sector by State, 2002	56
Table 6-5. Economic Impacts of the U.S. Retail Lawn and Garden Supply Stores Sector by State, 2002	57
Table 6-6. Economic Impacts of the U.S. Retail Building Materials and Supply Stores Sector by State, 2002.....	58
Table 6-7. Economic Impacts of the U.S. Florists Sector by State, 2002.....	59
Table 6-8. Economic Impacts of the U.S. Retail Food and Beverage Stores Sector by State, 2002	60
Table 6-9. Economic Impacts of the U.S. Retail General Merchandise Stores Sector by State, 2002.....	61
Table 7-1. Economic Impacts of U.S. Urban Forestry Tree Sales and Tree Care Services, 2002	63
Appendix Table A-1. Multipliers for the Nursery and Greenhouse Sector	72
Appendix Table A-2. Multipliers for the Lawn and Garden Equipment Manufacturing Sector.....	73
Appendix Table A-3. Multipliers for the Landscaping Services Sector.....	74
Appendix Table A-4. Multipliers for the Landscape Architecture Sector.....	75
Appendix Table A-5. Multipliers for the Wholesale Flowers, Nursery Stock and Florist Supply, and Wholesale Equipment Distribution Sectors (Wholesale Trade)	76
Appendix Table A-6. Multipliers for the Lawn and Garden Store and Building Materials & Supplies Sectors.....	77
Appendix Table A-7. Multipliers for the Florist Sector (Miscellaneous Retail Stores)	78
Appendix Table A-8. Multipliers for the Food and Beverage Stores Sector.....	79
Appendix Table A-9. Multipliers for the General Merchandise Stores Sector.....	80
Appendix Figure A-1. Detailed Structure of the Green Industry in the United States	81

Glossary of Economic Impact Terms

Terms are presented in groups within a logical rather than alphabetical order

Region defines the geographic area for which impacts are estimated. Regions are generally an aggregation of one or more counties. This analysis includes estimates for individual states of the U.S.

Sector is a grouping of industries that produce similar products or services. Most economic reporting and models in the U.S. are based on the Standard Industrial Classification system (SIC code) or the North American Industrial Classification System (NAICS).

Impact analysis estimates the impact of a change in output or employment resulting from a change in final demand to households, governments or exports.

Input-output (I-O) model. An input-output model is a representation of the flows of economic activity between industry sectors within a region. The model captures what each business or sector must purchase from every other sector in order to produce its output of goods or services. Using such a model, flows of economic activity associated with any change in spending may be traced either forwards (e.g., spending generates employee wages which induces further spending) or backwards (e.g., purchases of plants that leads growers to purchase additional inputs -- fertilizers, containers, etc.). Multipliers for a region may be derived from an input-output model of the region's economy.

IMPLAN is a micro-computer-based input output modeling system and Social Accounting Matrix (SAM). With IMPLAN, one can estimate I-O models of up to 528 sectors for any region consisting of one or more counties. IMPLAN includes procedures for generating multipliers and estimating impacts by applying final demand changes to the model. The current version of the software is *IMPLAN Pro 2.0*.

Final Demand is the term for sales to final consumers (households or government). Sales between industries are termed **intermediate sales**. Economic impact analysis generally estimates the regional economic impacts of final demand changes.

Direct effects are the changes in economic activity during the first round of spending. **Secondary effects** are the changes in economic activity from subsequent rounds of re-spending. There are two types of secondary effects: **Indirect effects** are the changes in sales, income or employment within the region in backward-linked industries supplying goods and services to businesses. For example, the increased sales in input supply firms resulting from more nursery industry sales is an indirect effect. **Induced effects** are the increased sales within the region from household spending of the income earned in the Green Industry and supporting industries. Employees in the Green Industry and supporting industries spend the income they earn on housing, utilities, groceries, and other consumer goods and services. This generates sales, income and employment throughout the region's economy. **Total effects** are the sum of direct, indirect and induced effects.

Multipliers capture the size of the secondary effects in a given region, generally as a ratio of the total change in economic activity in the region relative to the direct change. Multipliers may be expressed as ratios of sales, income or employment, or as ratios of total income or employment changes relative to direct sales. Multipliers express the degree of interdependency between sectors in a region's economy and therefore vary considerably across regions and sectors. **Type I** multipliers include only direct and indirect effects. **Type II** multipliers also include induced effects. **Type SAM** multipliers used by IMPLAN additionally account for capital investments and transfer payments such as welfare and retirement income. A **sector-specific multiplier** gives the total changes to the economy associated with a unit change in output or employment in a given sector. **Aggregate multipliers** sum multiplier effects across many sectors with a single number. They are based on an assumed distribution of spending across these economic sectors, i.e., a weighted average of sector specific multipliers with the percentage of spending in each sector as the weighting factor.

Purchaser prices are the prices paid by the final consumer of a good or service. **Producer prices** are the prices of goods at the factory or production point. For manufactured goods the purchaser price equals the producer price plus a retail margin, a wholesale margin, and a transportation margin. For services, the producer and purchaser prices are equivalent.

Margins. The retail, wholesale and transportation margins are the portions of the purchaser price accruing to the retailer, wholesaler, and grower, respectively. Only the retail margins of many goods purchased by consumers accrue to the local region, as the wholesaler, shipper, and manufacturer often lie outside the local area.

Measures of economic activity. **Sales or output** is the dollar volume of a good or service produced or sold. **Final Demand** is sales to final consumers, including households, governments, and exports. **Intermediate sales** are sales to other industrial sectors. **Income** is the money earned within the region from production and sales. Total income includes personal income (wage and salary income, including income of sole proprietor's profits and rents). **Jobs** or employment is a measure of the number of jobs required to produce a given volume of sales/production, usually expressed as full time equivalents, or as the total number including part time and seasonal positions. **Value Added** is the sum of total income and indirect business taxes. Value added is the most commonly used measure of the contribution of a region to the national economy, as it avoids double counting of intermediate sales and captures only the "value added" by the region to final products.