Economic Impacts of the Green Industry in the United States

www.utextension.utk.edu/hbin/greenimpact.html

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. *Implan* 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.

Executive Summary

The environmental horticulture industry, also known as the "Green Industry", is comprised of a variety of businesses involved in production, distribution and services associated with ornamental plants, landscape and garden supplies and equipment. Segments of the industry include wholesale nursery, greenhouse and sod growers, landscape architects, contractors and maintenance firms, retail garden centers, home centers and mass merchandisers with lawn and garden departments, and marketing intermediaries such as brokers, horticultural distribution centers, and re-wholesalers. In addition to these commercial sectors, many state and local governments have significant urban forestry operations for management of parks, botanic gardens, and right-of-ways that are an integral segment of community infrastructure. The Green Industry is linked to urban forestry by providing quality plant material and professional personnel with specialized expertise for growing, maintaining, and managing city trees.

Environmental horticulture is one of the fastest growing segments of the nation's agricultural economy, often experiencing growth and expansion even during recessionary periods. The nursery and greenhouse sector has experienced considerable growth in the last two decades, albeit slowing somewhat in recent years. The landscape design, construction, and maintenance sector has also expanded due to strong economic conditions and robust building activity. Retail sales of horticultural goods have increased for both independent and chain-store type retailers, with considerable consolidation occurring due to the increased presence of home centers and mass merchants in the lawn and garden marketplace. The outlook for the Green Industry is promising, yet there are several challenges that will increase competitive pressures.

In view of its importance, numerous studies have been conducted to document the Green Industry's economic impacts in individual states or regions, however, the present study represents the first attempt to evaluate it economic impacts for the entire United States, using data from previous studies together with secondary industry statistics. A specific objective of the study was to evaluate the role, value and economic impact of forest tree species (woody ornamental trees) in the urban forestry environment.

Nationwide estimates of the economic impacts of the Green Industry were derived from a variety of information sources, including industry statistics from the U.S. Economic Census and Census of Agriculture (2002), County Business Patterns, and primary surveys by horticulture economics researchers. Economic impacts for each state were computed using the *Implan Pro* software to build regional input-output models to derive economic multipliers that estimate the indirect effects of industry purchases and induced effects of employee household spending, and also capture the effects of taxes and transfer payments.

Economic impacts for the U.S. Green Industry in 2002 were estimated at $147.8 billion (Bn) in output, 1,964,339 jobs, $95.1 Bn in value added, $64.3 Bn in labor income, and $6.9 Bn in indirect business taxes, with these values expressed in 2004 dollars (Table ES-1). For the production and manufacturing sectors, including nurseries/greenhouses, lawn and garden equipment manufacturers, and greenhouse manufacturers, total output impacts were $34.6 Bn, employment impacts were 300,677 jobs, and value added impacts were $20.8 Bn. For the horticultural services sectors of landscape services and landscape architects, total output impacts were $57.8 Bn, employment impacts were 753,557 jobs, and value added impacts were $39.0 Bn. For the wholesale/retail trade sectors, total output impacts were $55.5 Bn, employment impacts were 910,104 jobs, and value added impacts were $35.3 Bn. The largest individual sectors in terms of employment and value added impacts were landscaping services (704,875 jobs, $35.6 Bn), lawn and garden stores (347,916 jobs, $14.8 Bn), nursery and greenhouses (261,408 jobs, $18.1 Bn), florists (200,451 jobs, $4.0 Bn), and building material supply stores (123,591 jobs, $6.5 Bn). Other sectors with large value added impacts were general merchandise stores ($4.0 Bn), landscape architects ($3.5 Bn), lawn and garden equipment manufacturers ($2.6 Bn), lawn and garden equipment wholesalers ($2.7 Bn), wholesale flower, nursery stock and florist supplies ($1.9 Bn), and food & beverage stores ($1.4 Bn).

Economic impact results are reported by state and region, as summarized in Table ES-2, Figures ES-1 and ES-2. Total value added impacts were largest in the Midwest region ($19.2 Bn), followed by the Pacific region ($18.4 Bn), Northeast ($17.9 Bn), and Southeast ($13.5 Bn). The largest individual states in terms of value added

impacts, all exceeding $3 billion, were California ($13.7 Bn), Florida ($7.1 Bn), Texas ($6.1 Bn), Illinois ($4.3 Bn), Pennsylvania ($3.7 Bn), New York ($3.5 Bn), and Ohio ($3.5 Bn).

Table ES-1. Summary of Economic Impacts of the U.S. Green Industry by Sector, 2002

Industry Group/Sector (NAICS)	Output ($Mn)*	Employ-ment (jobs)	Value Added ($Mn)*	Labor Income ($Mn)*	Indirect Business Taxes ($Mn)*
Production & Manufacturing	34,578	300,677	20,796	11,037	784
Nursery & Greenhouse (1114)	26,053	261,408	18,076	9,612	647
Lawn & Garden Equipment Mfg (333112)	8,281	37,343	2,610	1,346	129
Greenhouse Mfg (332311)	244	1,927	110	78	7
Horticultural Services	57,774	753,557	39,013	30,269	1,387
Landscaping Services (56173)	52,971	704,875	35,564	27,719	1,312
Landscape Architecture (54132)	4,803	48,683	3,449	2,549	74
Wholesale & Retail Trade	55,475	910,104	35,275	23,044	4,701
Wholesale Flowers, Nursery Stock and Florist Supplies (42293)	2,879	68,969	1,907	1,130	440
Garden Equipment Wholesale (421820)	4,146	40,617	2,737	1,601	657
Lawn & Garden Stores (4442)	22,859	347,916	14,806	9,747	1,810
Building Material Supply Stores (4441)	9,982	123,591	6,491	4,258	789
Florists (4531)	7,195	200,451	3,977	2,725	401
Food & beverage stores (445)	2,263	35,117	1,385	944	156
General merchandise stores (452)	6,150	93,443	3,973	2,639	448
Total All Sectors	147,828	1,964,339	95,084	64,349	6,872

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, U.S. Department of Commerce)

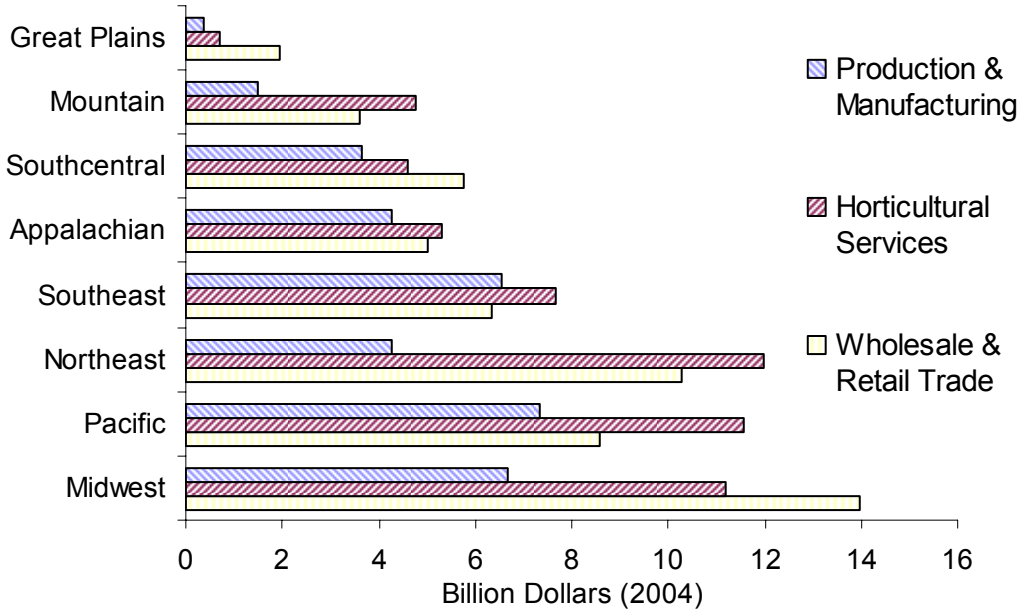


Figure ES-1. Output Impacts of the U.S. Green Industry, by Region and Industry Group, 2002

Table ES-2. Economic Impacts of the U.S. Green Industry by Region/State and Industry Group, 2002

Region or State	Output Impacts ($Mn)*	Employment Impacts (jobs)	Value Added Impacts ($Mn)*			
			All Sectors	Production & Manufact.	Horticultural Services	Wholesale & Retail Trade
East	**41,118**	**540,496**	**27,033**	**5,494**	**11,749**	**9,790**
Northeast	**26,568**	**336,027**	**17,867**	**2,986**	**8,250**	**6,632**
Connecticut	2,350	27,026	1,659	375	787	496
Delaware	448	6,359	297	44	148	104
Maine	509	7,825	331	39	166	126
Maryland	3,524	46,725	2,440	478	1,230	732
Massachusetts	3,239	37,553	2,159	122	1,225	811
New Hampshire	729	10,153	465	63	208	194
New Jersey	4,210	52,929	2,875	436	1,459	980
New York	5,265	62,113	3,511	437	1,363	1,711
Pennsylvania	5,589	75,829	3,672	924	1,430	1,319
Rhode Island	403	5,289	262	41	156	65
Vermont	302	4,225	196	25	78	93
Appalachian	**14,550**	**204,469**	**9,166**	**2,508**	**3,500**	**3,159**
Kentucky	1,257	21,649	821	112	245	464
North Carolina	5,155	67,472	3,583	1,387	1,261	935
Tennessee	3,854	50,812	2,050	689	648	713
Virginia	3,914	56,905	2,493	308	1,249	936
West Virginia	371	7,631	220	13	96	111
Central	**34,825**	**439,955**	**21,070**	**3,142**	**7,958**	**9,970**
Midwest	**31,825**	**397,099**	**19,243**	**2,994**	**7,494**	**8,754**
Illinois	6,897	75,110	4,335	430	1,972	1,933
Indiana	3,010	41,714	1,804	229	745	830
Iowa	1,459	20,820	906	62	216	627
Michigan	4,845	58,745	2,991	564	1,221	1,205
Minnesota	3,099	37,696	1,864	237	616	1,010
Missouri	2,488	37,690	1,495	134	470	890
Ohio	5,855	79,841	3,532	607	1,556	1,369
Wisconsin	4,170	45,483	2,317	731	697	890
Great Plains	**2,999**	**42,855**	**1,827**	**147**	**463**	**1,216**
Kansas	1,362	19,316	813	93	274	446
Nebraska	961	13,383	596	32	141	424
North Dakota	307	4,500	189	9	21	160
South Dakota	369	5,657	228	13	28	187
South	**34,559**	**498,420**	**22,150**	**6,301**	**8,194**	**7,656**
Southcentral	**13,992**	**209,935**	**8,615**	**1,974**	**3,039**	**3,602**
Arkansas	1,395	16,680	675	195	166	315
Louisiana	1,069	19,617	679	100	173	406
New Mexico	520	8,739	353	72	137	145
Oklahoma	1,352	24,603	819	247	212	359
Texas	9,656	140,295	6,088	1,360	2,351	2,377
Southeast	**20,568**	**288,486**	**13,535**	**4,327**	**5,155**	**4,054**
Alabama	1,681	26,804	1,148	353	434	360
Florida	9,997	147,795	7,076	2,463	2,747	1,866
Georgia	4,726	62,493	3,020	644	1,213	1,162
Mississippi	977	14,236	548	120	122	306
South Carolina	3,187	37,157	1,745	747	638	359
West	**37,326**	**485,467**	**24,830**	**5,859**	**11,112**	**7,859**
Mountain	**9,824**	**132,982**	**6,449**	**954**	**3,185**	**2,309**
Arizona	3,206	43,882	2,081	506	1,013	563
Colorado	3,085	37,630	2,019	178	1,083	758

Region or State	Output Impacts ($Mn)*	Employment Impacts (jobs)	Value Added Impacts ($Mn)*			
			All Sectors	Production & Manufact.	Horticultural Services	Wholesale & Retail Trade
Idaho	853	12,000	576	91	164	320
Montana	357	5,988	219	31	43	145
Nevada	1,248	17,324	844	13	633	198
Utah	901	13,577	600	130	206	264
Wyoming	174	2,581	109	4	44	61
Pacific	**27,502**	**352,485**	**18,382**	**4,905**	**7,927**	**5,550**
Alaska	159	2,110	104	10	36	58
California	20,362	253,977	13,656	3,165	6,429	4,063
Hawaii	745	11,166	531	200	220	112
Oregon	3,173	43,980	2,010	1,048	448	515
Washington	3,064	41,251	2,080	482	795	803
Total All Regions	**147,828**	**1,964,339**	**95,084**	**20,796**	**39,013**	**35,275**

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce)

The economic impacts of the urban forestry sector within the Green Industry were evaluated in relation to (1) the production of trees suitable for urban forestry by nurseries, and (2) tree care services provided by the landscape services sector. Based on survey information, the value of tree production suitable for urban forestry, including deciduous, evergreen, fruit, and Christmas trees, was $4.63 Bn. This value represented 27.2 percent of total output by the nursery and greenhouse sector. The value of tree care services was $9.92 Bn, which represented 27.1 percent of the output of the landscaping services sector. The total output of tree production and care services was valued at $14.55 Bn, which translated into $21.02 Bn in total output impacts, 259,224 jobs, $14.12 Bn in value added, $9.93 Bn in labor income, and $516 Mn in indirect business tax impacts. Trees sold to municipalities for use in urban forest settings (e.g., parks and other recreational areas) also are associated with significant public sector employment.

In addition to these economic impacts of commercial activity within the Green Industry, various studies have shown that urban forests have other non-monetary or non-market economic and environmental impacts, including energy savings for building heating and cooling, reduction of atmospheric carbon dioxide, improved air quality, reduction of stormwater runoff , and other aesthetic benefits. Well landscaped homes with appropriate tree canopy have a 7 to 11 percent premium in value compared to similar properties without such amenities.

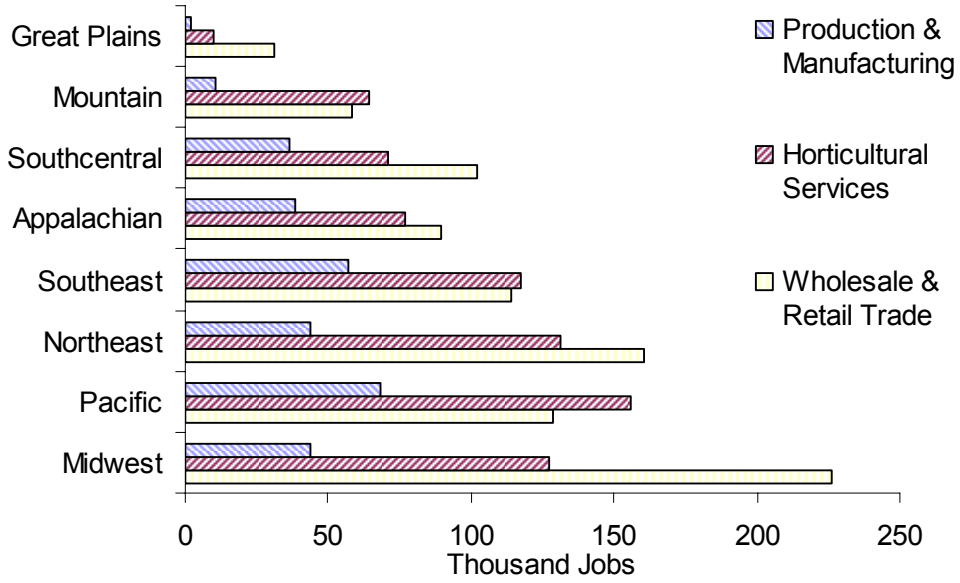


Figure ES-2. Employment Impacts of the U.S. Green Industry, by Region and Industry Group, 2002

1. Background and Introduction

The U.S. environmental horticulture industry, also known as the "Green Industry", is comprised of wholesale nursery and sod growers, landscape architects, designers/builders, contractors and maintenance firms, retail garden centers, home centers and mass merchandisers with lawn and garden departments, and marketing intermediaries such as brokers and horticultural distribution centers (re-wholesalers). This industry is one of the fastest growing sectors in the nation's agricultural economy; often experiencing growth and expansion even during recessionary periods.

The relationship between urban/community forestry and the Green Industry has become more widely recognized as urban forestry has become more acknowledged as an integral segment of the infrastructure of our communities. However, this relationship is still vastly unappreciated in terms of the degree of synergy that the two segments share. Not only is the Green Industry crucial for the support of urban forestry in providing quality plant material used in our cities, it also offers professional personnel with specialized expertise for growing, maintaining, and managing city trees. These professionals have demonstrated their willingness to educate, volunteer, and mentor city employees in the cities and towns where they make their homes and own businesses. Conversely, urban forestry initiatives provide the Green Industry with a strong, dependable, and expanding market in which they can sell their goods and services. Cities can rely on growers to produce the size and species they require, and they can also depend on a professional cadre of landscape contractors and tree care providers to help maintain the resource that a healthy urban or community forest offers to its citizens. Both entities enjoy the benefits of this symbiotic relationship, and each would be diminished without the other. The importance of developing a mechanism by which this relationship can be measured, therefore, is crucial to understanding how to best plan for the future strengthening of each.

In spite of the magnitude and recent growth and interest in the Green Industry, there is surprisingly little information that has been developed on the national level regarding the economic impact of the Green Industry. The USDA does conduct floriculture and nursery crop surveys to collect information at the grower level, but data are often incomplete for some states and grower cash receipts reported do not reflect the further economic impacts generated from this production activity. Census data, including the 10-year Census of Horticultural Specialties, are subject to the same limitations and have historically had other mitigating problems such as poor response rate that reflect poorly on the data's accuracy. For firms downstream in the supply chain, such as landscapers, re-wholesalers, and retailers, there are economic statistics and employment data maintained by each state's Office of the Comptroller. However, misclassification errors and non-compliance on the part of industry participants have made some state data speculative at best. There is a transition to a new system (called the North American Industrial Classification System, or NAICS for short) currently underway that should provide more robust estimates in the future. However, to date, no one source of data has proven historically to be instrumental in capturing the total economic importance of the Green Industry.

Recognizing the limitations of existing data sources and also the critical need for this type of economic impact data, several state nursery and landscape associations have sponsored and developed their own economic impact studies for their respective green industries. Such states have found these studies to be useful in communicating the importance of the Green Industry to state legislatures, and in combating proposed legislation that would have had severe negative impacts on urban or community forestry initiatives and the Green Industry (e.g., labor regulations, constraints on water usage, etc.). As useful as these state-specific studies have been, there have not been similar analyses conducted at the national level, which would provide similar benefits on a national scale.

The objective of this study is to estimate the economic impacts of the Green Industry at the national level, synergistically utilizing the studies that have already been conducted by several states, and complementing those with data from other primary and secondary sources. In addition, this study seeks to evaluate the value and role of forest tree species (woody ornamental trees) as a product. The project is funded under the third category of the NUCFAC 2003 Challenge Cost-Share Grant program (Communicating the Value of Urban and Community Forestry) with the research priority of "*measuring the national value of goods and services produced by the Green Industry*."

Green Industry Structure

The Green Industry complex includes input suppliers; production firms such as nursery, greenhouse, and sod growers; wholesales distribution firms, including importers, brokers, re-wholesalers, transporters; horticultural service firms providing landscape and urban forestry services such as design, installation, and maintenance; and retail operations, including independent garden centers, florists, home improvement centers, and mass merchandisers or other chain stores. The United States leads the world in the production and marketing of floriculture and nursery crops.

INPUT SUPPLY FIRMS

Input supply firms, often referred to as allied trade firms, are businesses that provide various inputs for ornamental plant production, landscape services, and retail sales. These inputs commonly include agrichemicals, fertilizers, containers, packaging, farm machinery, tools and equipment, propagative materials, and consulting services. These products originate from extractive and manufacturing industries such as mining, petroleum, and forestry.

PRODUCTION FIRMS

Participants engaged in producing Green Industry products include growers of floriculture crops, nursery crops, and turfgrass sod. *Floriculture crops* include bedding plants, potted flowering plants, foliage plants, cut cultivated greens, and cut flowers. As distinguished from nursery crops, floriculture crops are generally herbaceous. Bedding and garden plants consist of young flowering plants (annuals and perennials) and vegetable plants. They are grown in flats, trays, pots, or hanging baskets, usually inside a controlled greenhouse environment, and sold largely for gardens and landscaping.

Potted flowering plants are largely sold in pots for indoor use. The major potted flowering plants are poinsettias, orchids, florist chrysanthemums, and finished florist azaleas. Foliage plants are also sold in pots and hanging baskets for indoor and patio use, including larger specimens for office, hotel, and restaurant interiors. Cut flowers are usually sold in bunches or as bouquets with cut foliage. The most popular cut flowers are roses, carnations, gladioli, and chrysanthemums. Leatherleaf ferns are the leading cut foliage. Combining cut flowers and cut greens in bouquets or other flower arrangements is a value-added retail option.

The market outlets for floriculture crops are florists, garden centers, mass merchandisers, supermarkets, chain stores, discount stores, home improvement centers, hardware stores, landscape contractors, and re-wholesalers. Other retail outlets are farmers markets, flea markets, and street vendors. Since cut flowers are perishable and live floral crops are sensitive to variations in temperature, they usually require cool transportation and storage conditions that preserve and prolong their quality before final sale. The demand for floral crops, especially cut flowers, is highly seasonal. Sales are normally highest from February through May and in the fall. Sales of cut flowers peak during holidays such as Valentine's Day and Mother's Day. Poinsettia plants are sold mostly from Thanksgiving to Christmas. Cut flowers and foliage plants, however, are increasingly popular throughout the year as indoor home and workplace decorations.

Nursery crops are woody perennial plants that are usually grown in containers or in-ground. The Census of Agriculture defines nursery crops as ornamental trees and shrubs, fruit and nut trees (for noncommercial use), vines, and ground covers. They are primarily used for landscaping, not for producing edible products on a commercial scale. Trees and shrubs are classified as deciduous or evergreen. Deciduous includes shade, flowering, ornamental, fruit, and nut trees and shrubs. Evergreens include broadleaf and coniferous trees, and Christmas trees.

The location of nursery production is determined largely by soil, climate, availability of water, accessibility and distance to markets, and cost of land. Each plant species has a hardiness zone that sets the northern geographic latitude for in-ground growth. Trees and shrubs start out as "liners" (undeveloped, but rooted, trees and plants in pots or trays). As seedlings, they are typically protected from intense sunlight or severe weather by shade or temporary cover. The next step is transplantation into larger containers or the field for further growth. Sales can occur at any stage depending on the plants' commercial purpose.

Growers plant bare-root material ("liners") in rows in the field, either in the fall, giving the roots time to develop before the plant breaks dormancy, or in the spring. Broadleaf shrubs and trees (holly, oak, and magnolia, for example) are often purchased as small container-grown liners, which are more expensive than bare-root plants because fewer die after transplanting. Liner production requires 6-12 months for the roots to develop and the plant to reach the size needed for planting in the field. Bare-root material, the most economical nursery stock, is best planted in the early spring before growth begins.

Since nursery crops are usually grown in the field or in containers often without covered protection, the choice of crops is based on an area's natural vegetative species or the crop's ability to tolerate local climatic conditions. Thus, sales of most nursery crops, except Christmas trees, are more local or regional than floriculture crops, which are less costly to ship to farther markets. While homeowners are the typical consumers of trees, shrubs, and woody ornamental plants, markets also include developers, public utilities, golf courses, resorts, commercial parks, malls, as well as government agencies in charge of public parks, street and highway vegetation, and forests. Like many floral crops, demand for nursery crops (except Christmas trees) tends to coincide with normal planting seasons in the spring and fall.

Wholesale sales of nursery products are usually handled by salespersons who have established relations with large buyers. Marketing programs include numerous trade shows, advertising in trade publications, catalogs, and direct mail. Close planning with large buyers (referred to as partnering) is required to secure long-term markets and to ensure that the right product mix is produced; however, demand for different products can still vary substantially from year to year. Sales and many variable expenses (costs-of-goods-sold) are highly seasonal, with up to 50 percent of sales in the second quarter of a typical year. Cash flow is uneven throughout the year so cash management is important. Technical knowledge of plants and pests is important for nursery management, although many of the everyday tasks (cultural practices) are routine and do not require specialized labor. However, automation has proven to be difficult, aside from the widespread use of irrigation and fertilization systems. Greenhouse operations can be very sophisticated, with automatic irrigation and fertilization (sometimes referred to as fertigation), and air and lighting systems driven by a variety of sensors. Innovations demanded by big-box retailers (such as custom labeling, bar codes, scanners, and electronic data interchange between suppliers and buyers) are now used by many producers.

In recent years, there has been considerable consolidation among large growers, largely in response to consolidation occurring at the retail level. The rise of large, nationwide plant retailers like home centers and mass merchandisers has created a marketing opportunity for large growers who can supply the large volumes these customers require. Some nursery firms have grown rapidly through acquisition during the past decade, largely to service these big customers. Geared to serve big customers by handling large volumes, large growers actively discourage small-volume buyers. The big-box retailers and large landscape installation companies are supplied mainly by large nurseries, while independent garden centers, retail nurseries, and smaller landscape firms may be supplied by both large and small growers. Proximity and high product quality are more important to these buyers than low price because the end consumer is most interested in quality and the breadth of retail selection. Keeping plants alive and healthy is a challenge for many consumers, and small retail operations often have more technically knowledgeable staff than mass retailers to assist customers with plant care advice.

To even out the seasonal nature of demand throughout the year, many nurseries produce plants like Easter lilies and poinsettias that have demand at times other than late spring or fall. Large producers may also sell related products like soil, sod, and Christmas trees. Some growers may produce a range of soil mixtures made from peat moss, sand, bark, sawdust, lime, perlite, vermiculite, and other materials (including mulched product waste) to sell to other growers on a contract basis.

Turfgrass sod farms are specialized nurseries that usually only produce a subset of turfgrass varieties that are hardy for their particular region. Once sod leaves the nursery/farm, it usually passes through one or more marketing channels and is eventually used for new residential or commercial developments, for re-landscaping existing developments, for sports turf facilities such as athletic fields and golf courses, or for commercial applications that include businesses, public and private schools, and roadside uses. The final customer for sod can be the homeowner, a golf course, or an elementary school. Each of them has different circumstances and, hence,

different expectations. Thus, sod producers take these different needs into account. Although the customer generally decides the type of sod to purchase, the installer also plays an important role. Both the landscape contractor and sod installer often make the decision from whom to buy and may even recommend to the homeowner the type of sod to plant. Hence, although both the final consumer and the middleman are important, the latter is critical from the sod producers' perspective.

WHOLESALE DISTRIBUTION FIRMS

Wholesale distributors are an integral part of the Green Industry supply chain. Intermediaries such as brokers and importers facilitate the transactions of domestic and international (importing/exporting) growers and retailers. Re-wholesalers (often referred to as horticultural distribution centers, HDCs, or landscape distribution centers) are also market facilitators that offer regionally specific mixes of landscape products for immediate pickup or delivery to landscape professionals and have emerged throughout the United States in a variety of forms. There are self-contained HDCs and HDCs that serve as independent profit centers within vertically-integrated grower, landscape contracting, and retail garden center operations. Landscape distribution traces its development back to the produce dealers of the 1940s and 1950s. Following World War II, a sustained building boom fueled an increasing demand for products and services that landscape professionals, retail garden centers, and other horticultural businesses attempted to fulfill. At the same time, rising land values pushed the growers farther away from the spreading urban and suburban areas where the most demand existed. The resulting longer supply lines created difficulties in meeting the expanding needs of the horticulture industry. This spawned development of this new distribution network from the nursery grower to the horticultural customer.

The long-distance distribution system infrastructure for plants is still being refined in many parts of the country. An efficient trucking system extends from Florida all along the East coast, featuring regular routes run by independent trucking companies. Some large producers have developed in-house, large-volume delivery systems to service big-box retailers. But cross-country shipments are still difficult because of the long time that plants are in trucks, lack of back haul opportunities, and the excessive handling that takes place for small orders. Air transportation is being used more frequently, but only for high-value plants (e.g., cut flowers).

HORTICULTURAL SERVICE FIRMS

Horticultural service firms include those firms that provide a plethora of design (architectural) services, installation (construction) services, and maintenance services. These firms serve a variety of clientele, including residential homeowners, commercial business properties, and municipalities. Some firms in the industry offer a combination of design, installation, and maintenance services (e.g., design-build firms) to appeal to a larger clientele base. However, other businesses gear their services towards specific markets. For instance, some specialize in seeding and fertilizing areas along newly constructed highways and installing or constructing erosion control devices. Such work is usually contracted from state departments of transportation or subcontracted from state highway contractors working on federally funded projects. Local governments also use these services.

Landscape design or architectural establishments are primarily engaged in planning and designing the development of land areas for projects, such as parks and other recreational areas, airports, highways, hospitals, schools, land subdivisions, and commercial, industrial, and residential areas, by applying knowledge of land characteristics, location of buildings and structures, use of land areas, and design of landscape projects. Landscape contracting or installation establishments are primarily engaged in installing trees, shrubs, plants, lawns, or gardens, and the construction of walkways, retaining walls, decks, fences, ponds, and other similar (hardscape) structures. Specialized installation services such as irrigation systems, water features, night lighting, and Christmas decorations are becoming more prevalent.

Landscape maintenance establishments include firms that provide services such as mowing, trimming, leaf or snow removal, tree removal or trimming, mulching, and other garden and lawncare services. Lawncare services are defined more narrowly as services devoted to lawn "treatments" as opposed to the other "maintenance" activities listed. The difference is that treatment primarily involves applying fertilizers and pesticides to lawns, with the goal being to maximize lawn appearance and health while minimizing effort on the part of the client. The prime selling points of these service firms are that they have the knowledge and expertise to diagnose problems and apply lawn chemicals properly, effectively, and safely; they have the proper equipment to do the job; and they provide the materials, thus eliminating the need for homeowners to store toxic chemicals on residential

premises. Besides offering basic services, many lawncare firms also offer customized programs which often include lawn aeration, dethatching, resodding and/or overseeding, and integrated pest management.

RETAILERS

Retail firms are another point of contact with end consumers of horticultural products, such as independent garden centers, florists, home centers, mass merchants, and other chain stores. Garden centers are establishments primarily engaged in selling trees, shrubs, other plants, seeds, bulbs, mulches, soil conditioners, fertilizers, pesticides, garden tools, and other garden supplies to the general public. These establishments primarily sell products purchased from others, but may sell some plants which they grow themselves. Garden center consumer studies indicate customer loyalty and repeat business result from a convenient store location, plant quality, customer service, and plant selection. According to the latest National Gardening Survey, the number of households that purchased lawn and garden products at selected retail outlets in 2003 is outlined below:

Table 1-1. U.S. Households Purchasing Lawn and Garden Products, By Type of Outlet, 2003

Type of Retail Outlet	Number of Households (Millions)	Share of Households (%)
Home Center	45	53 %
Independent Garden Center	36	43 %
Mass Merchandiser	34	41 %
Hardware Store	25	30 %
Supermarket/Drug Store	16	19 %
Feed/Seed Store	10	12 %
Mail Order/Internet	6	7 %

END USERS

Final consumers of Green Industry products and services are referred to as end users. While the vast majority of nursery and turfgrass products used by end users are purchased from Green Industry businesses, this is not the case for services. A significant amount of lawn and landscape services are performed by the end users themselves. However, these services are only for internal consumption; that is, end users do not maintain or care for any landscape plants or green space other than their own.

The list of end users includes airports, cemeteries, churches, commercial general business areas, golf courses and driving ranges, homeowners, municipalities, private recreation areas, public roadways, schools and universities, and utilities. "Commercial areas" are comprised of restaurants, banks, credit unions, commercial building operators, shopping centers, real estate managers, apartment buildings, other dwelling operators, mobile home sites, hotels and motels, medical centers, nursing care centers, intermediate care facilities, general and specialty hospitals, residential care facilities, retirement communities, community centers, and adult and child day-care centers. City park districts, arboretums and zoos, city streets, and other urban public areas are maintained by municipalities. Public roadways encompass both state and county roadsides and highways.

The National Gardening Association is a well known and widely recognized authority on the consumer lawn and garden market in the United States. Since 1973, NGA has worked with the Gallup Organization (and now with Harris Interactive, Inc.) to provide market research information for the lawn, garden, and nursery industries. Some highlights of the latest NGA survey include:

- Eight out of ten U.S. households (78%), or 84 million households, participated in one or more types of do-it-yourself indoor and outdoor lawn and garden activities in 2003. That is about the same number seen in 2002, and one of the highest levels of participation seen in the past five years.
- Consumers spent an average of $457 per household on their lawns and gardens in 2003. Over the past five years, annual spending has averaged $465. USDA/ERS reports average household expenditures in 2003 on nursery and floral plants alone at $140 per household.
- Consumers spent a total of $38.4 billion on their lawns and gardens in 2003. That was about the same level of spending seen over last three years. Over the past five years, total lawn and garden sales have

increased at a compound annual growth rate of 5 percent, from $30.2 billion in 1998 to $38.4 billion in 2003.

- The most important consumers of lawn and garden products last year were men; people age 45 and older; college graduates; households with no children at home; households in the Northeast, South, and West; married households; 2-person households; and households with annual incomes over $75,000.

Current Green Industry Situation

Long term growth in output of the principal sectors of the US Green Industry is charted in constant dollar terms for the period 1987 to 2003 in Figure 1-2. Information on the landscape services and retail sectors was available only through 2001, due to the changeover to the NAICS system. It is evident that the sales output of the landscape services sector has grown dramatically, from around $15 Bn in 1987 to nearly $40 Bn in 2001, representing an average annual growth rate of 11.0 percent. The retail nurseries and garden stores sector also grew significantly, although at a lower level, from $3.7 to $6.2 Bn as gross margin on sales, averaging 5.0 percent annual growth. The nursery and greenhouse sector grew in real terms from $10.7 Bn to $14.7 Bn in 2003, or at a 2.4 percent average annual rate. The lawn and garden equipment manufacturing sector actually declined in value from $8.3 to $7.1 Bn between 1998 and 2003, a -2.7 percent annual rate.

Nursery and Greenhouse Growers

Although grower receipts from greenhouse and nursery crops are expected to be up by less than 1 percent in 2004, they still represent another year of an unbroken series of annual sales increases. Sales of floriculture crops are also projected to be up slightly following a small decline in 2003 (USDA, NASS). Among floriculture product groups, cut flowers, potted flowering plants, and cut cultivated greens experienced reduced sales in 2003, largely due to competition from imports, and sales are projected to be down again in 2004 even as most prices continue upward. Bedding and garden annual and perennial plants and propagative materials are the only floriculture crops whose sales are expected to be higher in 2004. Nursery crops are also forecasted to extend annual sales gains into 2004, in part because of still-robust new housing construction.

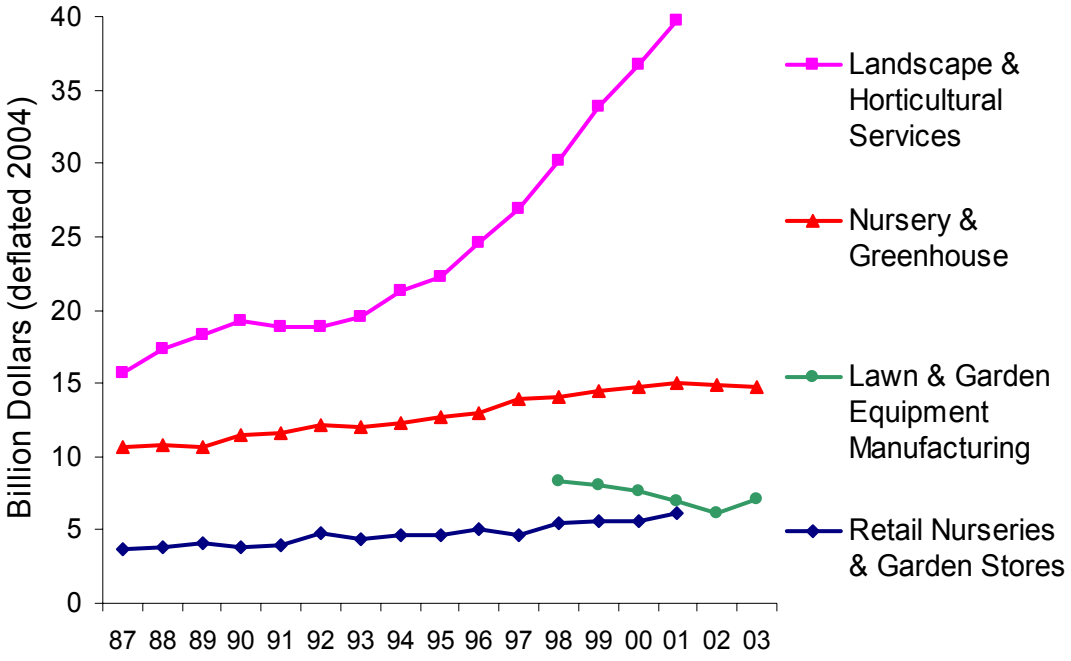


Figure 1-1. Growth in Output of US Green Industry Sectors, 1987-2003.
Values expressed in constant 2004 dollars using GDP Implicit Price Deflator (USDOC).
Data Sources: USDOC/BEA; USDA/ERS (nursery & greenhouse).

An important reason that nursery crop sales remained healthy in 2003, compared with floriculture crops, is the lower share of imports in nursery crop consumption. Relentless competition from imported cut flowers from South America has reduced domestic growers' U.S. market share to minority status. Per-household consumption of greenhouse and nursery crops of $139 in 2004 represents the second year of decline since its peak in 2002, matching the pattern of floriculture crops. Nevertheless, the ornamental crop sector will post total sales in excess of $15.3 billion in 2004, a value exceeded only by corn, soybeans, and vegetables among agricultural crops nationwide.

Sales of floriculture crops were projected to grow to $5.1 billion in 2004, due largely to gains from bedding and garden plants which represent 48 percent of total floriculture sales. Sales of bedding and garden annuals and herbaceous perennials are forecast to increase 1 percent. This contrasts with declines in cut flowers, potted flowering and foliage plants, and cut cultivated greens as competing imports provide further incentives for growers to produce other higher value and specialty crops. However, outsourcing cuttings and seedling production to lower-cost growers in Central America and Mexico is one way that domestic producers are coping.

Besides the top three producers of ornamental crops—California, Florida, and Texas—North Carolina and Oregon are close to reaching $1 billion in annual sales. Both of these States produce about $800 million worth of nursery and other greenhouse crops and only between $100 and $200 million of floriculture crops. Emerging competitors are Michigan and Ohio, which, by contrast, produced between $200 and $400 million of floriculture crops in 2003. These Midwestern States are leading producers of bedding and garden plants, both annuals and perennials, in large part due to increased greenhouse production. Michigan and Ohio are not far behind Texas in total greenhouse acreage. While Florida remains the predominant supplier of indoor foliage plants east of the Mississippi River, upcoming suppliers include North Carolina, Ohio, and Louisiana.

Together with bedding and garden plants, nursery and other greenhouse crops are the only agricultural product groups expected to continue gains in per-U.S.-household sales. Their higher sales in 2004 more than offset the declines in the other groups. Including Christmas trees, greenhouse vegetables, vegetable transplants, and sod, sales of nursery and other greenhouse crops have continuously grown historically but have slowed in recent years in terms of per-U.S.-household sales at around $93 since 2002. Given that this sector accounts for two-thirds of total greenhouse and nursery crop receipts, it is largely responsible for keeping per-household sales of ornamentals and other greenhouse crops at about $139 in recent years.

While the projected increase in floriculture growers' sales in 2004 is modest, average annual sales per grower is expected to continue rising beyond $1 million. As grower sales expand, either total production area also expands or sales per acre increases. In 2003, total U.S. floriculture production area increased largely due to Texas adding 10 times more space of open field production. Despite growth in open field production, average covered production area per large grower rose 3 percent to 4 acres, up from 3.9 in 2002. After climbing in 2002, the number of growers with at least $100,000 in annual floriculture sales fell from 4,974 to 4,741 in 2003. The addition of significant open field production area by growers pushed total production acres to 57,507 acres in 2003, up from 52,235 in 2002. However, since total production acreage grew faster than floriculture sales, average sales per acre dropped 9 percent, from $91,000 to $83,000, in 2003. Floriculture sales per production acre are still highest in the Midwestern States at $126,000. Growers in Minnesota lead the region at almost $230,000 sales per acre. Nevertheless, the largest growers based on floral sales are in the West—average sales per grower in California now exceed $1.8 million. While Southern States trail the West at $1.1 million sales, average sales per grower in South Carolina tops the country at $2.5 million sales per grower, dwarfing California's average. South Carolina is the biggest producer of herbaceous perennial plants, selling 12 percent of total U.S. production.

After slipping in 2002, U.S. cut flower imports surged 13 percent to $611 million in 2003, and are expected to continue to grow in 2004 (USDA, NASS). As a result, sales of domestically produced U.S. cut flowers are forecast down 1 percent in 2004, but consumer prices for flowers and indoor plants are up 18 percent from 2003. Cut flower production in California, which accounts for 70 percent of U.S. production, is at best flat in 2004, even in view of higher prices. The projected decline in volume of domestic cut flowers sold in 2004 is cushioned to some extent by somewhat higher prices. Overall sales of $421 million in 2004 are down 1 percent from 2003. As a result, sales per U.S. household fell to $3.83, almost a whole dollar lower than in 1997. By contrast, cut flower imports per U.S. household are almost $6, matching 1998's level. Cut flowers comprise half of total U.S.

floriculture and nursery stock imports. The share of imported cut flowers in total U.S. cut flower supply was 56 percent as recently as 2002. It is anticipated to jump to 63 percent in 2004. The number of cut flower producers in the United States was at a record low of 548 in 2003, down from 618 in 2002, and is expected to dwindle further. Despite fewer producers, average cut flower sales per U.S. grower have been growing and now approach $780,000 as the size of operations has expanded. By rank order, the largest average sales of growers are of roses ($701,000); gladioli, gerbera daisies, lilies (all around $500 million); and tulips and chrysanthemums (both about $300 million). In average unit prices, the leaders are pompon mums at $1.32 per bunch, orchids at $0.70 per bloom, and lilies at $0.64 per stem.

Sales of potted flowering plants are forecast at $820 million and foliage plants at $616 million in 2004, down slightly from $829 million and $623 million, respectively, in 2003 (USDA, NASS). Competition from fast-growing imports, especially from Canada, and crop damage from hurricanes in Florida will dampen sales prospects of domestic growers. Imports of orchid plants are also rising from Taiwan, Thailand, the Netherlands, South Korea, and Canada. Nevertheless, domestic grower sales of potted flowering plants per U.S. household have held steady at between $7 and $8, and between $5 and $6 for foliage plants, over the past decade. Florida dominates the foliage plant market, capturing 64 percent of total U.S. value in 2003. Prices of potted flowering plants have risen 6 percent on average since 2000, reflecting healthy demand for high-value varieties such as florist roses, florist azaleas, and spring flowering bulbs. Even prices of poinsettias, which account for 30 percent of total receipts from potted flowering plants in 2003, were up in the last two years. Prices of potted orchids, however, appear to be in a downward trend since 2000. The quantity of potted orchids sold jumped from 9.7 million in 2000 to 15.6 million in 2003, indicating increasing supply. Although producers boosted domestic orchid production, imported orchid plants have grown 70 percent in volume since 2000, providing ample competition to local growers.

Bedding and garden annuals dominate U.S. floriculture sales, comprising 36 percent of the $5.1 billion sales of floral crops in 2003 (UDA-NASS). Together with herbaceous perennial plants, the share is boosted to 48 percent. And since this sector posted a 1-percent sales gain in 2003, compared with declines in cut flowers, potted flowering plants, and cut cultivated greens, it was enough to push total floriculture receipts up. This growth is expected to repeat in 2004 as total bedding and garden receipts reach at least $2.424 billion, up $23 million from 2003. Sales of bedding and garden annuals are forecasted at $1.823 billion in 2004, continuing annual gains since 2000. Herbaceous perennial sales are also projected up, exceeding sales of foliage plants for the first time and becoming the second largest segment/product group in the industry. It is evident that growers are increasing production of annuals and perennials relative to other floriculture crops, more significantly in the Midwest and Northeast. Sales of annuals in flats were down in 2003 while potted annuals and hanging baskets registered gains. Although floriculture sales per U.S. household will continue to decline, albeit marginally, per household sales of bedding and garden plants are expected to remain at just over $22, unchanged since 2002. Prices of bedding and garden plants have been noticeably stable since 2000 as sales growth is matched by the pace of quantity produced. This price pattern is the effective average between weak prices of annuals and rising prices of perennials since 2001. For annuals, prices of potted plants and hanging baskets show a slight upward slope in contrast to downward prices of bedding and garden plants in flats. Increased production of bedding and garden annuals in the Midwest is supported by higher overall prices. But production of herbaceous perennials, except potted hardy/garden mums, is shifting heavily to Southern States, specifically South Carolina.

U.S. ORNAMENTAL IMPORTS

Expected prices for imported cut flowers are up 10 percent, due in part to the weaker U.S. dollar and higher fuel costs for transport (USDA-NASS). U.S.-grown cut flower prices are up 3 percent, due also in part to higher fuel and energy costs and damage to cut flower production by hurricanes in late summer. Import prices of cut flowers in 2004 are 15 percent higher than in 2000, after initially dropping 5 percent in 2002. Cut flower imports fell in 2001 and 2002 due to weak U.S. demand which was precipitated by the economic recession and stock market downturn. The share of imports in U.S. cut flower consumption is projected at a record 65 percent, up from 61 percent in 2003. In 1992, the import share was 20 points lower at 45 percent. The quantity of imported flowering and bedding plants, largely from Canada, are expected to be up 8 percent in 2004 based on strong shipments from January to July. However, lower prices for imported flowering, bedding, and foliage plants push the import value down somewhat from 2003. Ninety-four percent of U.S. imported cut flowers are from Colombia, Ecuador, the Netherlands, Mexico, Canada, and Costa Rica. Cut flower imports are dominated by roses at 35 percent of

imports, chrysanthemums at 11 percent, and carnations at 10 percent. Imports of flowering plants from Asia, such as orchids, and nursery plants and trees from Canada limit wholesale prices that domestic growers of these products can charge without losing market share. These help explain in part why wholesale prices of U.S.-grown potted flowering plants and bedding and garden plants have been generally flat since 2000. But for growers in the Midwestern and Eastern States, prices have improved relative to some growers in the South and especially in contrast to growers in the West.

LAWN AND GARDEN EQUIPMENT

U.S. demand for power lawn and garden equipment is projected to rise over 3 percent per year through 2009, reaching $10.7 billion, according to a new study by the Freedonia Group. An expansion of the key 55-64 year-old age group will contribute to gains, the report says, as this group typically trades up from older, less expensive equipment to higher-end products, or increasingly engages professional lawn care services. Growth will also result from product innovations and upgrades, driven by consumer demand for equipment with increased horsepower, additional features and lighter weight. The continued popularity of golf will also present opportunities, as a growing number of golf courses compete to have the best playing surfaces.

The residential market dominates power lawn and garden equipment sales, representing approximately two-thirds of the total in 2004. However, advances in the commercial market have outpaced the residential market in recent years, bolstered by the tremendous growth in the sales of zero-turn radius turf mowers. In addition, the continuing rise in the number of professional landscapers (in part a byproduct of an aging population) has boosted commercial demand. Although gas-powered equipment will remain dominant, electric-powered products are expected to post significantly stronger gains through 2009. Battery-powered equipment will fare particularly well, as improved battery technology is introduced. Cordless products are easy to use and have a better environmental image than competitive products. In addition, they appeal to women, who account for a growing portion of equipment sales and use.

Lawnmowers will continue to be the largest product segment, benefiting from their wide use in both residential and commercial applications. Turf and grounds equipment is expected to post the best gains, because of continuing growth in the professional landscaping services industry and the rising number of golf courses. Despite the improving durability of original equipment, parts and accessories will outpace the industry average due to the rising amount of stock in use.

HORTICULTURAL SERVICE FIRMS

Landscape-related firms surveyed in August 2004 by *Lawn & Landscape* magazine said that 2004 business revenue is up an average of 17.4 percent, individual service sales have increased in all categories, and net profits are projected to rise. Contributing to the industry's sound standing is an increase in consumer spending and a healthy housing market. Overall, 2004 represented encouraging economic times for the Green Industry. In contrast to previous annual surveys, contractors say their 2004/2005 concerns have shifted from matters such as finding adequate labor to cost-based concerns such as escalating health insurance and workers' compensation rates, as well as increased fuel expenses. Many contractors are focusing on raising business efficiency to combat these costs. Landscape companies are younger today, with the average age being 13.6 years old in 2004 versus 17.7 years old in 1999. In fact, a greater percentage of contractors – 28 percent – have been in business less than five years, compared to 12 percent in 2000, 15 percent in 2001 and 17 percent in 2003. Landscape companies that have operated more than five years include 23 percent who have been in business five to nine years, 25 percent who have been in business 10 to 15 years, and 24 percent who have been in business more than 20 years. Despite the fact that these companies are younger, they are generating more revenue, on average, today at $732,353, compared to $694,300 in 2002.

In terms of growth, the percentage of contractors who said their total gross sales revenue would increase in 2004 surpassed the percentage who felt this way in previous years. For instance, 84 percent of contractors said their 2004 revenue would increase compared to 57 percent in 2003 or 59 percent in 2002. In fact, going back to 1997, the percentage of contractors predicting growth for a single year has never been higher than in 2004. The next closest percentage of contractors foreseeing growth was 72 percent in 1998. Contractors predicted an increase of net 17.4 percent this year. This is up from last year's 13 percent, but down when compared to the rates

experienced five years ago. For instance, contractors averaged 24 percent growth in 1998 and 19 percent growth in 1999.

Today's typical landscape contractor offers a wider array of services than in the past. Historically, lawn maintenance has represented the greatest total revenue for landscape businesses. Almost 33 percent of contractors said construction generated their greatest total revenue in 2004. This was fairly consistent but slightly higher than in previous years. In 1997, 30 percent of contractors claimed construction generated more revenue and, in 1998, 27 percent said it was their top revenue source. In contrast, fewer contractors claim that chemical lawn care or arborist services generate a majority of their sales than in years past. This year, 10 percent of contractors said chemical lawn care was their most profitable service, while 11 and 14 percent of contractors reported this in 1997 and 1998, respectively. Only 2 percent of contractors said arborist services represented their greatest revenue source, compared to 8 percent in 1997 and 7 percent in 1998.

Nearly half of landscape businesses – 49 percent – said they have become more diverse in the past two years, offering a greater number of services, while 16 percent said they have become more specialized. Thirty-five percent of contractors reported no change in their service structure. Considering the two primary services for a landscape business – lawn maintenance and construction – *Lawn & Landscape* broke down the research to find out what other services typical mowing and design/build companies offer. For instance, 59 percent of the companies who primarily mow also offer construction services, 24 percent also offer chemical lawn care, and 53 percent also offer arborist services. Among firms identifying themselves as primarily construction companies, 63 percent also offer lawn maintenance, 23 percent offer chemical lawn care services and 70.6 percent offer arborist services. In terms of 2004 service growth, all areas are experiencing growth. Lawn maintenance is up15 percent, construction is up 11 percent, chemical/fertilizer services are up 9 percent, irrigation is up 5 percent, snow and ice control services are up 3 percent, arbor services are up 2 percent, and nursery/retail services are up 1 percent.

Green Industry Outlook

Green Industry participants are facing both challenges and opportunities in today's marketplace. While plant breeders have provided new varieties at a dramatic pace in recent years, which has helped to keep the consumer interested in the industry's products, the demands of retailers are probably having a greater influence in shaping the marketplace for all of those in the market channel, with the possible exception of the consumer. Indeed, retailers are competing for market share and, in their efforts, they are changing the picture of horticulture as seen by both the consumer to whom they sell and the producers from whom they buy.

At the consumer level, the marketplace can best be viewed as divided between so-called "traditional retailers" and mass marketers. Traditional retailers or "independents" would include retail florists, who tend to focus on cut flowers and cut flower arrangements for special occasions, and garden centers, which, in addition to their traditional inventories of trees and shrubs and, in recent decades, bedding and garden plants, are increasingly carrying more and more potted flowering and foliage plants.

On the mass market side of the ledger, supermarkets have become the primary vendors of everyday cut flowers for the home, as well as for potted flowering plants. Increasingly, supermarkets are being viewed as vendors of holiday flowers and plants purchased for gifts. Some supermarkets carry foliage plants quite regularly, and some, in selected markets, have started to sell bedding/garden plants seasonally. Another mass marketer type would be the discount store; these retailers tend to focus on bedding and garden plants in the spring and potted flowering plants for Easter and Christmas. Some also include foliage plants in their offerings. In cases where these retailers have added perishable groceries to their mix (e.g. Wal-Mart SuperCenters and Super Kmarts), they have also added cut flowers as part of the retail format. Target, which had been very involved seasonally in the bedding/garden plant market throughout the country, has reduced this involvement to Florida, California, and selected other southwestern states, where there is more of a year-round market and where they have built permanent garden centers alongside their stores. Nationally, Target maintains a small foliage plant display in most stores, and they carry blooming holiday plants for Easter and Christmas.

The other dominant mass marketer type is the home improvement/hardware/home center, dominated by Home Depot and Lowe's. These retailers focus on bedding and garden plants to accompany their lines of trees and shrubs and lawn and garden hard goods (garden tools, fertilizers and chemicals, lawn mowers, hoses, and sprinklers, etc.), but they also carry both potted flowering and foliage plants on a weekly basis in established garden departments. At Easter and Christmas, these retailers also display racks of lilies and poinsettias throughout their stores.

CONSUMER TRENDS

Consumers are very divided by the various retail opportunities for nursery and floricultural products. First, it must be noted that there are very few retailers that can carry a mix that is representative of all of the major industry segments (nursery crops, cut flowers, potted flowering plants, foliage plants, and bedding/garden plants). Hence, many consumers are forced to shop among several retailer types to see the full array of product opportunities. Second, retailers vary dramatically in the selection offered, as well as the qualities, quantities, and sizes in the products and services they provide. Hence, if consumers have particular needs in mind, they may be forced to shop around to find their ideal retail offering. Of course, pricing varies among the retailers, as well.

Working on the side of many retailers is the overall lack of knowledge by the majority of consumers about the industry's products. For mass marketers, the lack of knowledge by the average lawn and garden consumer makes retailing a generic selection of dominant varieties and colors quite acceptable, especially if the retailer is able to attract consumers through the lowest price. For the traditional retailer able to attract the flower or plant aficionado through better quality, wider selection, or better service, the niche opportunities provide their *raison d'être*. Yet, consumers increasingly report that if they know what they want and they are looking for the bread-and-butter staples, they can get a great deal by buying at mass marketers.

PRODUCER CHALLENGES

The evolving marketplace has certain challenges for the grower. In many instances, buyers for mass marketers have added what must be considered artificial conditions to the buying arrangements. Some buyers have added "pseudo grades and standards" to plants based on shelving heights or personal preferences, rather than based on generally accepted plant-to-pot ratios; sometimes these conditions are set only to allow the retailer to better exhibit various differences among groups of plants being sold at different price points. Premium versus promotional plants being sold side-by-side provides an example. Ironically, such conditions sometimes make it easier for the uninformed consumers to recognize differences for their dollars. However, growers are sometimes forced either to sell perfectly acceptable plants at discounts because their dimensions fail to measure up to a particular buyer's prerequisites or to culturally curtail plant growth to keep plants within the standards. Growers also are forced to choose among production strategies depending on the desired market outlet. On the one hand, growers producing for mass marketers typically will grow large quantities of a limited number of products in highly automated operations. On the other hand, growers producing for independents typically will grow fewer numbers of a wider selection of products in much less-automated surroundings.

Consolidation of retailers has also presented some not-so-obvious marketing challenges for growers. There are instances in the marketplace where buyers are placing real or suggested limits on producers about which competitors they can sell to or on how much of a producer's output they are willing to buy. The restraint of trade issues notwithstanding, such actions limit producer options. Growers rightfully want to spread their eggs among as many baskets as possible, but options are dwindling as certain chains continue to consolidate and as financial realities force smaller chains and/or independents out of business.

In many markets, the big box chains often come onto the scene opening huge numbers of stores in a relatively short time. While this is the nature of mass markets, these actions, which have forced smaller retailers from the scene, have also had the effect of forcing producers to scramble to maintain any market opportunities to which they can sell. Sometimes the chains enter a new market and bring established supply relationships with them from distant locations, rather than developing new relationships with local producers. With alternative local retailers pressured, local growers often find themselves challenged to find an inviting market channel.

Conversely, as chains move from market to market, a number of buyers have asked growers to supply not only those stores that have been supplied in the past, but also additional stores being built or acquired. Due to

production or servicing constraints, additional volume is often beyond the means of certain suppliers. For the sake of buying efficiency, chain buyers have sometimes changed suppliers to those willing to add production volumes. There have also been instances where a chain has changed the buyers or their responsibilities, forcing producers to again compete and establish relationships with the new buyers.

One phenomenon affecting growers is the relatively new auction buying by a number of chains, particularly supermarkets. Perhaps caused by consolidation and/or centralization of buying functions, a number of chains have asked growers to participate in online reverse auctions to bid for their business (e.g., www.florabid.com). In such instances, purchases are made from growers willing to supply to a set of predetermined and written specifications, which are published online. Thus, superior quality is not encouraged nor rewarded, as the product is seldom seen by buyers. Instead, growers are forced to produce to the minimum standards to remain as competitive as possible.

Another decision being considered by several chains is whether to move to a pay-by-scan transaction basis. Today, most chains pay for the product delivered. But several chains (e.g. Home Depot) are considering moving to paying only for the product scanned at checkout. This would force producers to absorb the entire shrinkage now assumed by retailers. It might also force growers to modify their product and/or service protocols to help assure getting paid for their efforts. More frequent deliveries of smaller quantities per delivery and the servicing of retail displays are two possible examples of changes growers will be forced to make. Cash flow considerations are another concern, as well as who pays the costs of employee and/or customer theft. This pay-by-scan change would benefit the retailer, who will be able to radically reduce inventory dollars from their books. Such a move would increase the retailer's return on assets, something of particular importance to Wall Street, as market opportunities become more limited due to store saturation.

STRUCTURAL IMPACTS ON THE INDUSTRY

The impacts of the mass marketers on the nursery and floricultural industry are tremendous. To their credit, many would argue that the chains have exposed many more consumers to nursery and floral products. There is no doubt that this is true, as the presence of mass marketers has opened not only the consumers' eyes to the industry's products, but additional market opportunities for producers as well. This has forced independent retailers to become more savvy a marketing by looking for ways to increase customer service. Mass marketers have also facilitated the growth of offshore cut flower producers as major suppliers to the U.S. consumer. In recent years, offshore producers have also become providers of many of the cut flower bouquets now offered at retail stores. These bouquets were formerly assembled in the United States near the cities in which they were sold.

Domestically, the impact of the mass marketing of nursery and floricultural crops has led to the increased formation of larger and larger producer operations. The capital requirements needed to afford the infrastructure required to move mass quantities of product in a confined marketing window exceed those that this industry has historically managed. Most firms have been able to generate the capital on their own, but the industry also has seen examples of investment brokers entering the industry to help finance some of these production operations.

In many instances, chain buyers have limited the number of firms with whom they deal in any market area, as chains have come to realize certain efficiencies in merchandising products if fewer vendors are utilized. Chains have begun asking vendors to provide care for in-store displays, especially during the bedding/garden plant season, something that is easier to request if one firm handles all of the merchandise. Whether or not producers are rewarded for the additional expense of providing fully managed displays is debatable, but some growers report that the improved product care leads to additional turns (inventory turnover), which provide the needed results.

There are also several instances of producers partnering with smaller firms in order to handle the volumes required to supply burgeoning chains. In one instance, there may be as many as 40 growers involved in cross-docking activities to satisfy one chain's needs in a market area. Depending on the arrangements, this helps to spread the risk among several producers. Still, there are numerous examples of producers who supply 50 percent, 75 percent, or even 100 percent of their output to one chain; when asked about risk, these growers often respond with discussions about production efficiencies and questions about what they could do even if they wanted to change, noting that their competitors would love to steal the account.

In contrast, the focus on mass marketers by large growers has created opportunities for smaller growers to develop niches serving independent retailers or to go into retailing themselves, selling directly to the consumer. In a recent survey of growers, it was found that the majority of several thousand producers surveyed did some retailing of their own, whether that was 1 percent or 100 percent of their production. Smaller growers appeared to sell higher percentages, on average, of their production at retail. Yet, some larger producers have also used their own retail sales as a tactic for diversification. In many instances, producers in the middle seemed to focus their production on selling to independent retailers, perhaps including a retail operation of their own.

The other impact of mass marketers on the industry has been one of consolidation. In recent years, grower numbers have appeared to decline from year to year, or at best, remain stable. One could debate why the producer numbers are diminishing, but many would argue that the stresses of either supplying mass marketers or competing with them as an independent grower-retailer are taking their toll. The capitalization requirements, the reduced margins, the increased demands, the risk associated with fewer customer numbers, and the resulting consequences should that risk come to be realized have all created market pressures for larger producers. The struggle to remain competitive in a viable niche for smaller producers can be equally trying in markets being inundated by competing chains. There are already certain markets where independents can hardly be found.

Previous Economic Impact Studies

In spite of the magnitude and recent growth of the Green Industry outlined above, there is surprisingly little information that has been developed at the national level regarding the economic impact of the Green Industry. The USDA does conduct floriculture and nursery crop surveys to collect information at the grower level, but these data are often incomplete for some states and the cash receipts reported for/by growers do not reflect the further economic impacts generated from this production activity. Census data, including the 10-year Census of Horticultural Specialties, is subject to the same limitations and has historically had other mitigating problems such as poor response rate, which reflects poorly on the data's accuracy. For firms downstream in the supply chain, such as landscapers, re-wholesalers, and retailers, there is Standard Industrial Classification (SIC) data maintained by each state's Office of the Comptroller, but misclassification errors and non-compliance on the part of industry participants have made some state's data speculative at best. There is a new sectoring scheme called the North American Industrial Classification System, or NAICS for short, which should provide more robust estimates in the future. However, to date, no one source of data has proven to be adequate in capturing the total economic importance of the Green Industry.

Recognizing the limitations of existing data sources and also the critical need for this type of economic impact data, several state nursery and landscape associations have sponsored and developed their own economic impact studies for their respective green industries. Such associations have found these studies to be useful in communicating the importance of the Green Industry to state legislatures, in gaining assistance and resources, and in combating proposed legislation that would have had negative impacts on urban or community forestry initiatives and the Green Industry. As useful as these state-specific studies have been, there have not been comparable analyses conducted at the national level that would provide similar benefits on that scale. Additionally, each of the researchers conducting state-level studies used different research methodologies in their respective analyses, which were completed in different time frames. Thus the cross-sectional and time-series comparability of such studies is quite limited. Nonetheless, this chapter attempts to summarize the findings of previous studies so that a common "point of departure" can be used as a benchmark from which to compare the results from this study which is national in scope.

Table 1-2 presents an overview of previous economic impact studies that have been conducted [in the last five years] regarding the Green Industry in selected states. While there have been other studies conducted (mostly by the Agricultural Statistics Service in respective states) that estimate grower-level sales or cash receipts, this summary only presents those that provide subsequent post-farm gate economic impacts. There have been other economic impact studies conducted in some states regarding turfgrass-related economic impacts (Table 1-3), but the focus here is on the economic impacts of the entire Green Industry. In Table 1-2, the studies are listed by state in alphabetical order. Total Green Industry sales are presented, along with the total employment and payroll associated with Green Industry sectors. Some state studies also provided estimates of value added and taxes paid

by Green Industry participants and those are listed where applicable. To gain a common basis on which to perform a comparison of the results from each state, total population during the year of the study is tabulated, along with each state's Gross State Product (GSP). In concept, an industry's GSP (or its value added) is equal to its gross output (sales or receipts and other operating income, and inventory change) minus its intermediate inputs (use of goods and services purchased from other U.S. industries or imported). Thus, the GSP accounts provide data by industry and state that are consistent with the Nation's gross domestic product (GDP) by industry accounts. However, total GSP for the Nation differs from GDP in the national income and product accounts for three reasons. First, like the national estimates of GDP by industry, GSP is measured as the sum of the distributions by industry of the components of gross domestic income. Second, GSP excludes (and GDP by industry include) compensation of Federal civilian and military personnel stationed abroad and government consumption of fixed capital for military structures located abroad and for military equipment, except domestically located office equipment. Third, GSP and GDP often have different revision schedules.

Table 1-2 also includes an estimate of the calculated share of each state's GSP that the Green Industry represents; an unadjusted Green Industry sales (impact) per capita calculation; and an adjusted sales (impact) per capita estimate. This adjusted sales impact involves multiplying each unadjusted per capita estimate by the respective GDP implicit price inflator for each respective year to convert all per capita estimates to 2004 dollars. As shown in the table, economic impacts estimated in the selected studies ranged from $186 million in Massachusetts and Vermont to a high of $10.3 billion in California. Florida was a close second with $9.2 billion and Texas ranked third with just over $9 billion in economic impact. Even with this being a subset of 23 states (only impact studies that have been conducted over the last five years were included), total economic impacts amounted to almost $60 billion (not adjusted for inflation). Adjusted per capita economic impacts ranged from $223 per person in Maine, largely due to its small industry relative to its population, to a high of $618 per person in Florida. The value on a per capita basis averaged across all states was $380 per person. The number of jobs represented by Green Industry firms ranged from 5,400 jobs in Vermont to just over 168,900 jobs in California. Texas and Florida ranked second and third in terms of Green Industry-related employment with 222,000 and 187,859 jobs respectively.

However, the reader is cautioned against making direct comparisons from state to state due to the differences in research methods utilized in each state. For example, the data collection procedures often differed dramatically in that some states used mail or telephone surveys to collect primary data, while others relied heavily on secondary data sources, and others used enumerators (often Agricultural Statistics Service personnel) to interview Green Industry participants directly to collect primary data. Another important difference is the number and type of sectors that were included in each respective study's definition of the Green Industry (refer to the last column of Table 1-2). For example, some states included all end users such as households, golf courses, and sports complexes, while others did not. Last, the model used to determine economic multipliers differed between the studies. Many of the researchers used the IMPLAN® (input-output) economic impact modeling system to conduct their respective analysis, but not all.

All of these factors again point to the dire need to conduct a study that is national in scope that uses a common methodology to collect industry data and calculate associated economic impacts. The next chapter will provide a detailed description of the methodology used in this study that was used to guarantee results that will be comparable across states.

Table 1-2. Summary of Selected Recent Studies on Economic Impacts of the Green Industry in Individual States

State	Year	Output Impact (million $)	Employment Impact (jobs)	Impact per Capita ($) [a, b, c]	Sectors Included[d]
Arizona	2002	1,200	24,100	$230	P, L
California	2001	10,337	168,867	$321	P, R
Colorado	2002	1,500	45,000	$347	P, L, G, F, BG, R
Connecticut	2003	949	41,000	$278	P, L, R
Florida	2000	9,164	187,859	$618	P, L, R, T
Idaho	1999	662	12,911	$566	P, L, F, A, R
Illinois	1999	3,950	160,000	$352	P, L, R
Louisiana	2001	2,215	56,686	$524	P, G, L, R, RHA
Maine	2003	286	10,000	$223	P, L, R
Maryland	2000	1,152	14,800	$235	P, L, R
Massachusetts	2003	1,860	52,000	$296	P, L, R
Minnesota	2002	2,110	28,200	$437	P, L, R
Nevada	2002	751	15,736	$361	P, RW, L, G
New Hampshire	2003	438	12,100	$347	P, L, R
Ohio	2001	3,950	96,600	$368	P, L, RW, R
Pennsylvania	2000	3,300	107,000	$291	P, L, R
Rhode Island	2003	329	10,000	$312	P, L, R
South Carolina	1999	1,380	24,710	$381	P, L, F, R
Tennessee	2000	2,782	73,000	$528	P, L, R
Texas	2000	9,760	222,000	$504	P, L, R
Utah	2000	800	15,000	$386	P, L, R
Vermont	2003	186	5,400	$307	P, L, R
Wisconsin	2002	2,706	43,000	$518	P, HH, PG, G
Total		61,768	1,425,969	$380	

Notes/Sources:

[a] Population data: U.S. Census Bureau, State & County Quickfacts (quickfacts.census.gov/qfd/index.html).

[b] Impact per capita equals total Green Industry output impact divided by Total Population.

[c] Output impacts per capita were adjusted to 2004 dollars using GDP Implicit Price Deflator (US Commerce Dept.).

[d] Sector codes = [P] Producer; [L] Landscape-related; [R] retail; [RW] Re-wholesale; [F] Florist; [G] Golf; [BG] Botanical gardens; [HH] Households; [A] Arborists; [T] Trade; [RHA] Related horticultural activities; [PG] Public government.

Table 1-3. State-Specific Studies of Economic Impacts of the Green Industry, 1978-2004

Year Reported	State	Scope
2004	Wisconsin	Green Industry Survey
2004	New England	Environmental Horticulture
2003	California	Nursery Industry
2003	New Jersey	Turfgrass Industry
2003	New York	Turfgrass Industry
2002	Nevada	Green Industry Operations
2002	Colorado	Green Industry
2002	Michigan	Turfgrass Industry
2002	Arizona	Green Industry
2002	Georgia	Golf Course and Landscape Maintenance
2001	Iowa	Turfgrass Industry
2001	Idaho	Green Industry
2001	Ohio	Green Industry
2001	Louisiana	Green Industry
2001	Illinois	Green Industry
2001	Florida	Environmental Horticulture Industry
2000	Kansas	Horticulture Industry
2000	Texas	Green Industry
2000	Virginia	Turfgrass Industry
2000	Maryland	Horticulture Industry
2000	Missouri	Nursery Industry
2000	Pennsylvania	Green Industry
2000	Minnesota	Nursery and Landscape Industry
1999	South Carolina	Horticulture Industry
1999	North Carolina	Turfgrass
1999	Arizona	Green Industry
1999	Wisconsin	Turfgrass Industry
1998	Missouri	Turfgrass Industry
1998	New England	Environmental Horticulture Industry
1997	Florida	Environmental Horticultural Industry
1997	Oregon	Nursery and Greenhouse Industry
1997	Louisiana	Nursery and Turfgrass Industry
1996	Maryland	Turfgrass Industry
1996	Mississippi	Turfgrass Industry
1996	Washington	Nursery and Landscape Industry
1996	Ohio	Nursery Industry
1995	New Mexico	Turfgrass Industry
1995	Louisiana	Green Industry
1994	Arizona	Green Industry
1994	Kansas	Turfgrass Industry
1994	North Carolina	Turfgrass Industry
1994	South Carolina	Golf Industry
1994	South Carolina	Ornamental Horticulture and Turfgrass Industry
1994	Kansas	Horticulture Industry
1993	Colorado	Green Industry
1993	Texas	Green Industry
1993	Tennessee	Nursery and Floriculture Industry
1990	Michigan	Nursery and Landscape Industry
1989	Ohio	Turfgrass Industry
1989	Kentucky	Turfgrass Industry
1989	Pennsylvania	Turfgrass Industry
1989	Michigan	Turfgrass Industry
1987	Oklahoma	Turfgrass Industry
1986	North Carolina	Turfgrass Industry
1985	New Jersey	Turfgrass Industry
1984	Rhode Island	Turfgrass Industry
1982	Virginia	Turfgrass Industry
1978	Oklahoma	Turfgrass Industry

2. Research Methodology

Industry Sector Classification

The economic sectors associated with the environmental horticulture or "Green" Industry were identified, based on their primary product or service activity as described in the North American Industry Classification System (Office of the President, 1997) as indicated in Table 2-1. Production and manufacturing includes the sectors for nursery and greenhouse, lawn and garden equipment manufacturers, and greenhouse manufacturers (prefabricated metal buildings). The horticultural services sector includes landscaping and landscape architecture. Wholesale and retail trade of horticultural goods includes sectors for flower, nursery stock and florist supplies wholesalers, lawn and garden stores, and florists. In addition, building material and supplies dealers, food and beverage stores, general merchandise stores, and farm and garden equipment wholesalers all have significant sales of horticultural merchandise as port of their overall business.

Table 2-1. Classification of Economic Sectors Associated with the Green Industry

Industry Sector	NAICS Code
Nursery & Greenhouse	1114
Lawn & Garden Equipment Mfg	333112
Greenhouse Manufacturing (Prefab. Metal Buildings)*	332311
Landscaping Services	56173
Landscape Architectural Services	54132
Flower, Nursery Stock And Florist Supplies Wholesalers	42493
Lawn & Garden Equipment & Supplies Stores	4442
Florists	4531
Building Material & Supplies Dealers*	4441
Food & Beverage Stores*	445
General Merchandise Stores*	452
Farm & Garden Machinery & Equipment Wholesalers*	421820

* Merchandise or product line sales of horticultural goods represents a portion of overall business.
Source: Executive Office of the President, Office of Management and Budget. North American Industry Classification System, United States, 1997.

Information Sources

Economic information on the Green Industry in the United States was compiled from a variety of sources. For the nursery and greenhouse sector, national and state information on number of farms and value of sales were taken from the Census of Agriculture for 2002 (USDA, 2004). For the various services and trade sectors, information on number of establishments, employment, and sales (receipts) were taken from the 2002 Economic Census Industry Report Series for U.S. totals, while state-level information on number of firms, employment and payroll in 2002 were taken from County Business Patterns (US Census Bureau, 2004, 2005). For the sectors whose primary business is not in horticulture (such as general merchandise stores), employment and payroll were estimated in proportion to horticulture merchandise or product line sales as a share of total sales. Also, state-level information on number of firms, employment and payroll were adjusted to match the U.S. totals. The Census of Agriculture and Economic Census were considered to be the most reliable information sources available, since they have well-established statistical methodologies, with adjustment for small or non-responding firms, and provide published confidence parameters. For some states in which employment and wages were non-disclosed because of a small number of firms reporting, employment was estimated at the midpoint of the range indicated, and payroll was estimated at the national average annual wages per employee.

According to Census Bureau data, the number of establishments, employment, payroll, and sales receipts for sectors of the Green Industry in the United States in 2002 are shown in Table 2-2. There were a total of 255,389 business establishments involved in the industry, including 56,233 nursery producers or manufacturers, 82,683 horticultural services firms, and 116,473 wholesale/retail trade firms. Total reported employment was 1.085 million employees, and total payroll was $46 billion (Bn), excluding the nursery and greenhouse sector. Total sales receipts in 2002 were $147.1 Bn, including $23 Bn for producers, $38.8 Bn for horticultural services, and $85.3 Bn for wholesale/retail trade.

Table 2-2. Sales and Employment in the U.S. Green Industry, 2002

Sector (NAICS code)	Establish-ments	Paid Employees	Annual Payroll ($Mn)	Sales Receipts ($Mn)
Production/Manufacturing	**56,233**	**173,403**	**26,896**	**23,000**
Nursery & Greenhouse (1114)	56,070	150,543	4,459	16,362
Lawn & Garden Equipment Manufacturing (33311)	145	22,201	681	6,517
Prefabricated metal buildings (332311) (Greenhouses)*	18	659	21,756	121
Horticultural Services	**82,683**	**551,641**	**12,839**	**38,804**
Landscaping Services (56173)	76,458	514,962	11,509	35,235
Landscape Architectural Services (54132)	6,225	36,679	1,330	3,569
Wholesale & Retail Trade Horticulture Products	**116,473**	**510,512**	**10,676**	**85,305**
Flower, Nursery Stock and Florist Supplies Wholesalers (42493)	4,816	60,010	1,580	10,022
Lawn & Garden Equipment & Supplies Stores (4442)	21,065	171,149	3,769	30,953
Florists (4531)	22,753	113,929	1,489	6,597
Building Material & Supplies Dealers (4441)*	18,623	60,450	1,608	13,201
Food & Beverage Stores (445)*	22,465	19,222	330	3,090
General Merchandise Stores (452)*	22,710	56,651	955	9,898
Farm & Garden Equipment Wholesalers (42382)*	4,041	29,102	945	11,541
Total All Sectors	**255,389**	**1,235,557**	**50,410**	**147,109**

* Payroll and employment estimated proportional to merchandise line sales of total sales.

Sources: 2002 Economic Census, 2002 Census of Agriculture (USDA/NASS), 2001 *Implan* data for the US (nursery & greenhouse employment, payroll)

Primary market research data regarding the structure and performance of the nursery industry were generated by the Fourth National Nursery Industry survey conducted by the S290 Multi-state Regional Research Committee, a group of agricultural economists and horticulturists from 24 land-grant institutions across the country (including the principal investigators of this project). A total of 44 states participated in this survey. It is through the S290 survey efforts conducted in early 2004 that detailed data regarding sales of urban forest tree species were collected. For the first time in the survey's history, a standard methodology of obtaining a sample frame was used. The population lists for each state were assembled from the respective Department of Agriculture offices responsible for licensing nursery producers. A master file of all certified/licensed nursery operations was compiled at the University of Florida. Two states that had recently completed nursery surveys were excluded (AL and AZ) in addition to four other states that had extremely small nursery numbers (AK, KS, MD, and WI). The remaining 44 states resulted in a combined listing of 38,269 certified/licensed nursery operations. Based on considerations of budget and statistical reliability, a sample of 15,888 firms was selected for the survey, with sampling in each state based on its proportion of the overall nursery population. Where information was available on nursery production area, inventory or sales volume, sampling was stratified for three size classes: small (less than five acres), medium (5 to 19 acres), and large (20 or more acres). Sampling was weighted on larger firms, with 100 percent of the large nurseries, 60 percent of the medium nurseries, and 25 percent of the small nurseries. In several states, the nursery acreage values were not available, or not available for all certified or licensed operations, and in these states 40 percent of the identified firms were sampled. The final sample included 3,476 large nurseries, 3,778 in the medium category, 5,996 of the small firms, and 2,338 of unknown size. There were a total of 2,485 usable returned questionnaires returned, representing an overall response rate 15.9 percent. The number of respondents from individual states ranged from as few as 10 in Nevada to 476 in Florida.

Economic Impact Analysis

To evaluate the broad regional economic impacts of the Green Industry in the United States, regional economic models were developed for each state using the *Implan* software system and associated state datasets (MIG, Inc., 2004). The *Implan* system includes over 500 distinct industry sectors. The sectors pertinent to the Green Industry are indicated in Table 2-3 and Figure 2-1. The information for these models was derived from the U.S. National Income and Product Accounts, together with regional economic data collected by the U.S. Department of Commerce, Bureau of Economic Analysis. Input-output models represent the structure of a regional economy in terms of transactions between industries, employees, households, and government institutions (Miller & Blair, 1985). The *Implan* data used for this analysis was based on fiscal year 2001.

Economic multipliers derived from the models were used to estimate the total economic activity generated in each state by sales (or output) to final demand or exports. This includes the effects of intermediate purchases by industry firms from other economic sectors (indirect effects) and the effects of industry employee household consumer spending (induced effects), in addition to direct sales by industry firms. The regional *Implan* models were constructed as fully closed models, with all household, government, and capital accounts treated as endogenous, to derive Social Accounting Matrix (SAM) type multipliers, which represent transfer payments as well as earned income. Separate multipliers are provided for output (sales), employment, value added, labor income, and business taxes. The output total effects multipliers for each industry sector and state are shown in Table 2-4. The direct, indirect, and induced effects multipliers for output, value added and employment for each industry sector are shown in the Appendix Tables. The multipliers for output, value added, labor income, and indirect business taxes are expressed in units of dollars per dollar output, while the employment multiplier is expressed in jobs per million dollars output. The total output multipliers generally range from 1.8 to 2.8, meaning that for each dollar of sales to final demand, total output generated in the region (state) is $1.80 to $2.80. Differences in values of the multipliers reflect the structure of industry sectors and regional mix of supplier industries. The multipliers were applied to estimated industry sales or output in order to estimate total economic impacts. For the producer and service sectors, total economic impacts were estimated as:

$$I_{hij} = S_{hi} \times [\, A_{hij} + E_{hi} \times (B_{hij} + C_{hij})];$$

and for the wholesale trade sectors, impacts were estimated as:

$$I_{hij} = S_{hi} \times G_i [\, A_{hij} + E_{hi} \times (B_{hij} + C_{hij})];$$

and for the retail trade sectors, impacts were estimated as:

$$I_{hij} = S_{hi} \times G_i [\, A_{hij} + B_{hij} + C_{hij}],$$

where

I_{hij} is total impact for measures (j) of output, employment, value added, labor income, or indirect business. taxes, in each sector (i), and state (h).
S_{hi} is industry sales in sector i and state h.
E_{hi} is the proportion of industry sales exported or shipped outside the state, by sector i in state h.
A_{hij} is the direct effects multiplier for measure j in sector i and state h.
B_{hij} is the indirect effects multiplier for measure j in sector i and state h.
C_{hij} is the induced effects multiplier for measure j in sector i and state h.
G_i is the gross margin on retail sales for sector i.

The calculation for the producer, wholesale, and service sectors assumes that only the export portion of output is sold to final demand, and therefore is subject to the indirect and induced effects multipliers, while the remainder of in-state sales is subject to intermediate demand from other business sectors and to direct effects multipliers. Data on exports were taken from the *Implan* database for 2001 or 1999, except in the case of the nursery and greenhouse sector, where information for some states was taken from the 2003 National Nursery Survey. The calculation for retail and wholesale sectors assumed output is reduced to reflect only the gross margin on sales according to national averages: 20.1 percent for flower and nursery stock wholesalers, 24.7 percent for general merchandise stores, 26.5 percent for lawn and garden equipment wholesalers, 28.5 percent for food and beverage stores, 29.5 percent for lawn and garden stores, 29.5 percent for building materials and supply stores, 42.3 percent for florists (miscellaneous retailers) [Census Bureau, Annual Benchmark Reports for Retail Trade & Food

Services, and for Wholesale Trade]. All results were stated in 2004 dollars by adusting values using the Gross Domestic Product (GDP) Implicit Price Deflator (U.S. Department of Commerce).

Table 2-3. *Implan* Sectors Used for Economic Impact Analysis of the Green Industry

Implan Sector Name (Number)	Horticulture Industry Sector Covered
Nursery & Greenhouse (6)	Nursery & Greenhouse
Lawn & Garden Equipment Mfg (258)	Lawn & Garden Equipment Mfg
Prefabricated Metal Building & Component Mfg. (232)	Greenhouse Manufacturing
Services To Buildings And Dwellings (458)	Landscaping Services
Architectural And Engineering Services (439)	Landscape Architectural Services
Wholesale Trade (390)	Flower, Nursery Stock & Florist Supplies Wholesalers Farm & Garden Machinery & Equipment Wholesalers
Building Material And Garden Supply Stores (404)	Lawn & Garden Equipment & Supplies Stores Building Material & Supplies Dealers
Miscellaneous Store Retailers (411)	Florists
Food And Beverage Stores (405)	Food & Beverage Stores
General Merchandise Stores (410)	General Merchandise Stores

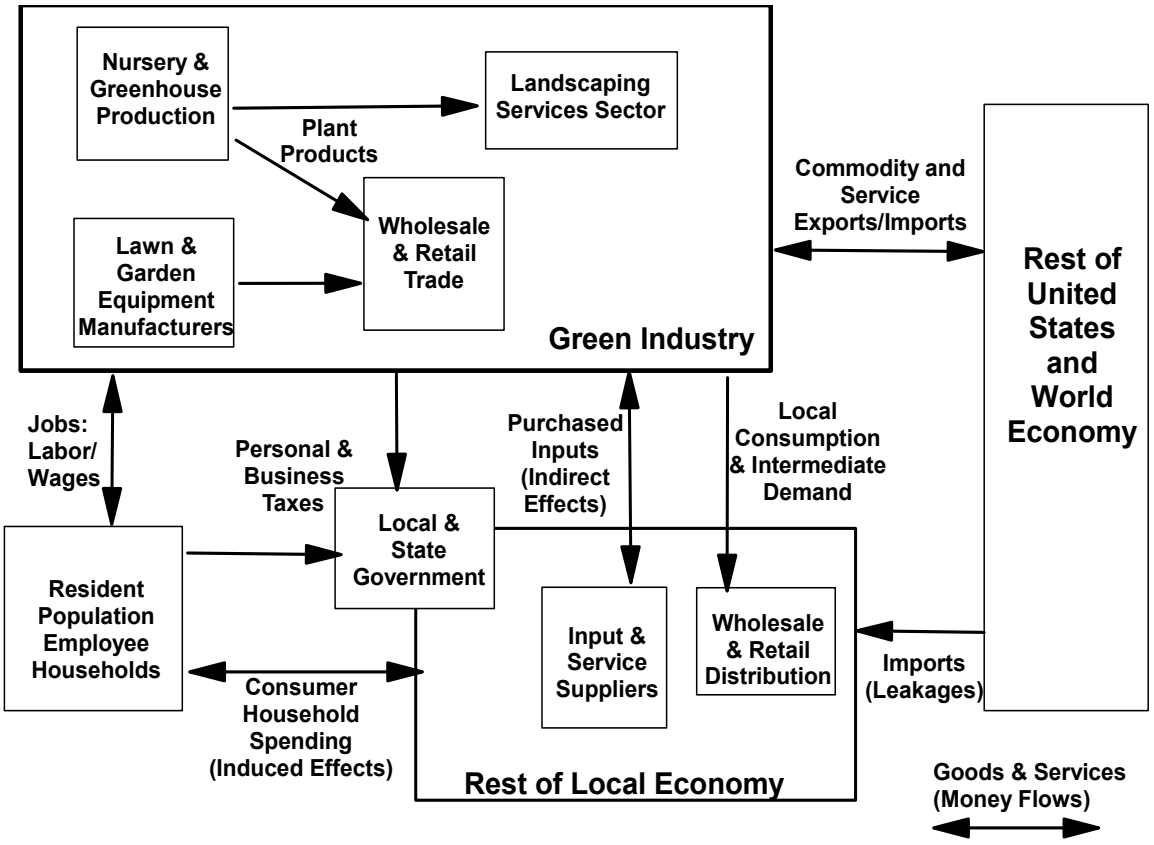


Figure 2-1. Market Structure and Economic Linkages of the Green Industry

Table 2-4. Output Total Effects Multipliers for the Green Industry, by Sector and State (2001)

State	Nursery & Greenhouse	Lawn & Garden Equipment Mfg	Landscaping Services	Landscape Architecture	Wholesale Trade (Hort. Goods, Equip.)	Lawn & Garden Stores (Bldg. Mat./Supl)	Florists (Misc. Retailers)	Food & beverage stores	General merchan-dise stores
Alabama	1.976	1.932	2.186	2.104	2.166	2.157	2.143	2.156	2.156
Alaska	1.877	0.000	1.991	2.017	1.997	2.024	2.030	2.026	2.019
Arizona	2.213	1.929	2.368	2.390	2.438	2.436	2.483	2.456	2.433
Arkansas	1.922	1.768	2.051	1.997	2.051	2.063	2.065	2.069	2.062
California	2.480	2.180	2.687	2.666	2.722	2.711	2.790	2.743	2.712
Colorado	2.434	2.222	2.613	2.635	2.714	2.703	2.768	2.725	2.700
Connecticut	2.011	0.000	2.289	2.258	2.318	2.318	2.414	2.361	2.321
Delaware	1.873	0.000	2.020	1.976	2.025	2.040	2.033	2.041	2.037
Florida	2.370	2.001	2.572	2.548	2.603	2.600	2.661	2.636	2.597
Georgia	2.258	2.157	2.547	2.530	2.580	2.580	2.646	2.618	2.582
Hawaii	2.303	0.000	2.419	2.388	2.392	2.412	2.401	2.411	2.410
Idaho	2.052	0.000	2.190	2.147	2.164	2.175	2.200	2.191	2.176
Illinois	2.387	2.435	2.627	2.643	2.690	2.693	2.782	2.736	2.696
Indiana	2.092	2.096	2.232	2.187	2.261	2.275	2.298	2.291	2.274
Iowa	1.955	1.903	2.116	2.066	2.133	2.122	2.113	2.122	2.119
Kansas	2.119	1.876	2.268	2.218	2.286	2.292	2.309	2.305	2.291
Kentucky	1.916	1.874	2.071	2.021	2.018	2.037	2.048	2.046	2.039
Louisiana	2.061	1.736	2.193	2.184	2.226	2.220	2.228	2.228	2.215
Maine	2.010	1.672	2.128	2.098	2.136	2.122	2.067	2.105	2.117
Maryland	2.393	2.128	2.603	2.629	2.622	2.623	2.634	2.633	2.622
Massachusetts	2.205	2.023	2.423	2.430	2.453	2.453	2.527	2.495	2.456
Michigan	2.140	2.060	2.305	2.269	2.322	2.343	2.405	2.376	2.345
Minnesota	2.317	2.091	2.552	2.545	2.605	2.607	2.688	2.645	2.607
Mississippi	1.908	1.822	2.063	1.985	2.049	2.043	2.018	2.036	2.039
Missouri	2.255	2.182	2.455	2.411	2.495	2.505	2.588	2.544	2.507
Montana	1.888	0.000	2.021	2.041	2.013	2.016	1.952	1.997	2.014
Nebraska	1.978	1.905	2.249	2.242	2.315	2.299	2.303	2.306	2.295
Nevada	2.156	0.000	2.193	2.201	2.192	2.215	2.237	2.225	2.216
New Hampshire	2.150	0.000	2.303	2.247	2.301	2.305	2.327	2.319	2.303
New Jersey	1.996	1.894	2.299	2.262	2.321	2.318	2.419	2.368	2.320
New Mexico	2.078	0.000	2.198	2.194	2.255	2.241	2.247	2.246	2.235
New York	1.979	2.053	2.207	2.238	2.276	2.276	2.378	2.334	2.278
North Carolina	2.095	2.034	2.348	2.268	2.325	2.318	2.319	2.320	2.317
North Dakota	1.768	1.587	1.960	1.934	1.957	1.959	1.942	1.952	1.957
Ohio	2.016	1.862	2.205	2.185	2.156	2.217	2.287	2.254	2.220
Oklahoma	2.276	1.985	2.387	2.304	2.357	2.361	2.362	2.369	2.362
Oregon	2.307	1.934	2.386	2.318	2.321	2.340	2.438	2.382	2.341
Pennsylvania	2.292	2.166	2.481	2.479	2.493	2.509	2.601	2.550	2.512
Rhode Island	1.884	0.000	2.024	1.991	1.998	2.007	1.964	1.992	2.005
South Carolina	1.986	1.871	2.164	2.088	2.134	2.134	2.109	2.126	2.130
South Dakota	1.870	1.798	2.090	2.065	2.128	2.110	2.053	2.082	2.105
Tennessee	2.289	2.089	2.409	2.337	2.387	2.384	2.414	2.403	2.384
Texas	2.490	2.142	2.593	2.534	2.588	2.551	2.600	2.576	2.548
Utah	2.424	2.201	2.595	2.560	2.618	2.621	2.654	2.640	2.621
Vermont	1.985	1.745	2.133	2.109	2.159	2.159	2.165	2.167	2.158
Virginia	2.213	1.929	2.423	2.405	2.463	2.481	2.523	2.503	2.480
Washington	2.161	1.796	2.306	2.251	2.231	2.254	2.309	2.279	2.259
West Virginia	1.921	0.000	1.939	1.878	1.853	1.870	1.853	1.869	1.872
Wisconsin	2.090	2.083	2.251	2.223	2.274	2.278	2.312	2.298	2.278
Wyoming	1.881	0.000	1.935	1.931	1.942	1.940	1.934	1.939	1.936

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)

3. Results for All Sectors

National Results

Economic impact estimates for each group and sector of the U.S. Green Industry are summarized in Table 3-1. Estimated impacts for all states were $147.8 billion (Bn) in output, 1,964,339 jobs, $95.1 Bn in value added, $64.3 Bn in labor income, and $6.9 Bn in indirect business taxes. Note that values for 2002 are stated in 2004 dollars. For the production and manufacturing sectors, including nurseries/greenhouses, lawn and garden equipment manufacturers, and greenhouse manufacturers, total output impacts were $34.6 Bn, employment impacts were 300,677 jobs, and value added impacts were $20.8 Bn. For the horticultural services sectors, including landscape services and landscape architects, total output impacts were $57.8 Bn, employment impacts were 753,557 jobs, and value added impacts were $39.0 Bn. For the wholesale/retail trade sectors, total output impacts were $55.5 Bn, employment impacts were 910,104 jobs, and value added impacts were $35.3 Bn.

The largest individual sectors in terms of output impact were landscaping services ($53.0 Bn), nurseries and greenhouses ($26.1 Bn), retail lawn and garden stores ($22.9 Bn), building material supply stores ($10.0 Bn), lawn and garden equipment manufacturers ($8.3 Bn), and florists ($7.2 Bn). In terms of employment impacts, the largest individual sectors were landscaping services (704,875 jobs), lawn and garden stores (347,916 jobs), nurseries and greenhouses (261,408 jobs), florists (200,451 jobs), and building material supply stores (123,591 jobs). Value added impacts by sectors were as follows: landscaping services ($35.6 Bn); nurseries and greenhouses ($18.1 Bn); lawn & garden stores ($14.8 Bn); building material & supply stores ($6.5 Bn); general merchandise stores ($4.0 Bn); florists ($4.0 Bn); landscape architects ($3.4 Bn); lawn and garden equipment manufacturers ($2.6 Bn); lawn and garden equipment wholesalers ($2.7 Bn); wholesale flower, nursery stock, and florist supplies ($1.9 Bn); and food & beverage stores ($1.4 Bn).

Table 3-1. Economic Impacts of the U.S. Green Industry, by Sector, 2002

Industry Group/Sector (NAICS)	Output ($Mn)*	Employ-ment (jobs)	Value Added ($Mn)*	Labor Income ($Mn)*	Indirect Business Taxes ($Mn)*
Production & Manufacturing	**34,578**	**300,677**	**20,796**	**11,037**	**784**
Nursery & Greenhouse (1114)	26,053	261,408	18,076	9,612	647
Lawn & Garden Equipment Mfg (333112)	8,281	37,343	2,610	1,346	129
Greenhouse Mfg (332311)	244	1,927	110	78	7
Horticultural Services	**57,774**	**753,557**	**39,013**	**30,269**	**1,387**
Landscaping Services (56173)	52,971	704,875	35,564	27,719	1,312
Landscape Architecture (54132)	4,803	48,683	3,449	2,549	74
Wholesale & Retail Trade	**55,475**	**910,104**	**35,275**	**23,044**	**4,701**
Wholesale Flowers, Nursery Stock and Florist Supplies (42293)	2,879	68,969	1,907	1,130	440
Garden Equipment Wholesale (421820)	4,146	40,617	2,737	1,601	657
Lawn & Garden Stores (4442)	22,859	347,916	14,806	9,747	1,810
Building Material Supply Stores (4441)	9,982	123,591	6,491	4,258	789
Florists (4531)	7,195	200,451	3,977	2,725	401
Food & beverage stores (445)	2,263	35,117	1,385	944	156
General merchandise stores (452)	6,150	93,443	3,973	2,639	448
Total All Sectors	**147,828**	**1,964,339**	**95,084**	**64,349**	**6,872**

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce)

State and Regional Results

Total output, employment, and value added impacts are summarized by state and region for each sector in Table 3-2 and Figures 3-1, 3-2, and 3-3. Output, employment, and value added impacts are detailed by individual sectors and states in Figures 3-4, 3-5, and 3-6 and Tables 3-3, 3-4, and 3-5, respectively. Total value added impacts were largest in the Midwest region ($19.2 Bn), followed by the Pacific region ($18.4 Bn), Northeast ($17.9 Bn), and Southeast ($13.5 Bn). The largest individual states in terms of output impacts (Figure 3-7), all exceeding $4 billion, were California ($20.4 Bn), Florida ($9.9 Bn), Texas ($9.7 Bn), Illinois ($6.9 Bn), Ohio ($5.9 Bn), Pennsylvania ($5.6 Bn), New York ($5.3 Bn), North Carolina ($5.2 Bn), Michigan ($4.8 Bn), and Georgia ($4.2 Bn). The largest individual states in terms of employment (Figure 3-8), all exceeding 60,000 FTE employees, were California (253,977), Florida (147,795), Texas (140,295), Ohio (79,841), Pennsylvania (75,829), Illinois (75,110), North Carolina (67,472), Georgia (62,493), and New York (62,113). The largest individual states in terms of value added impacts (Figure 3-9), all exceeding $3 billion, were California ($13.7 Bn), Florida ($7.1 Bn), Texas ($6.1 Bn), Illinois ($4.3 Bn), Pennsylvania ($3.7 Bn), New York ($3.5 Bn) and Ohio ($3.5 Bn). Detailed results for the major industry group of production/manufacturing, horticultural services and wholesale/retail trade are given in chapters 4, 5, and 6, respectively.

The Green Industry share of gross state product (GSP) by state is presented in Figure 3-10. GSP is the value added by the labor and property located in a state and is derived as the sum of the GSP originating in all industries in the state. In concept an industry's GSP, referred to as its "value added", is equivalent to its gross output (sales or receipts and other operating income, commodity taxes, and inventory change) minus its intermediate inputs (consumption of goods and services purchased from other U.S. industries or imported). Thus, GSP is often considered the state counterpart of the nation's GDP – one of the most featured measures of U.S. output. In practice, GSP estimates are measured as the sum of the distributions by industry and state of the components of gross domestic income -- that is, the sum of the costs incurred and incomes earned in the production of GDP. In the U.S., the total value added of the Green Industry ($95.1 Bn) represents slightly less than 1 percent of the GSP sum of all states ($10,830 Bn). The top five states with the highest relative percentage of state GSP (Figure 12) included Oregon (1.7%), Idaho (1.4%), South Carolina (1.4%), Florida (1.3%) and Wisconsin (1.2%).

Table 3-2. Economic Impacts of the U.S. Green Industry by State/Region and Industry Group, 2002

Region/State	Output Impacts ($Mn)*				Employment Impacts (jobs)				Value Added Impacts ($Mn)*			
	All Sectors	Prod. & Manuf.	Hort. Service	Trade	All Sectors	Prod. & Manuf.	Hort. Service	Trade	All Sectors	Prod. & Manuf	Hort. Service	Trade
East	**41,118**	**8,543**	**17,282**	**15,293**	**540,496**	**82,198**	**208,434**	**249,865**	**27,033**	**5,494**	**11,749**	**9,790**
Northeast	**26,568**	**4,283**	**11,993**	**10,292**	**336,027**	**43,799**	**131,563**	**160,664**	**17,867**	**2,986**	**8,250**	**6,632**
Connecticut	2,350	453	1,143	754	27,026	4,807	11,213	11,006	1,659	375	787	496
Delaware	448	53	228	166	6,359	375	3,194	2,789	297	44	148	104
Maine	509	56	253	201	7,825	665	3,252	3,908	331	39	166	126
Maryland	3,524	605	1,807	1,112	46,725	5,666	22,596	18,463	2,440	478	1,230	732
Massachusetts	3,239	199	1,787	1,252	37,553	3,411	16,549	17,593	2,159	122	1,225	811
New Hampshire	729	104	316	309	10,153	1,470	3,584	5,099	465	63	208	194
New Jersey	4,210	580	2,128	1,502	52,929	7,042	23,219	22,668	2,875	436	1,459	980
New York	5,265	751	1,887	2,627	62,113	5,344	18,704	38,065	3,511	437	1,363	1,711
Pennsylvania	5,589	1,377	2,091	2,120	75,829	13,803	25,433	36,593	3,672	924	1,430	1,319
Rhode Island	403	67	233	103	5,289	895	2,474	1,920	262	41	156	65
Vermont	302	37	119	146	4,225	322	1,344	2,559	196	25	78	93
Appalachian	**14,550**	**4,260**	**5,289**	**5,001**	**204,469**	**38,398**	**76,871**	**89,200**	**9,166**	**2,508**	**3,500**	**3,159**
Kentucky	1,257	138	373	746	21,649	1,941	5,644	14,065	821	112	245	464
North Carolina	5,155	1,756	1,925	1,473	67,472	12,992	29,072	25,408	3,583	1,387	1,261	935
Tennessee	3,854	1,741	975	1,138	50,812	16,603	13,793	20,416	2,050	689	648	713
Virginia	3,914	584	1,869	1,460	56,905	5,771	26,059	25,074	2,493	308	1,249	936
West Virginia	371	40	147	183	7,631	1,091	2,303	4,237	220	13	96	111
Central	**34,825**	**7,017**	**11,887**	**15,920**	**439,955**	**46,114**	**136,824**	**257,016**	**21,070**	**3,142**	**7,958**	**9,970**

Region/State	Output Impacts ($Mn)*				Employment Impacts (jobs)				Value Added Impacts ($Mn)*			
	All Sectors	Prod. & Manuf.	Hort. Service	Trade	All Sectors	Prod. & Manuf.	Hort. Service	Trade	All Sectors	Prod. & Manuf	Hort. Service	Trade
Midwest	**31,825**	**6,663**	**11,179**	**13,984**	**397,099**	**44,061**	**127,054**	**225,984**	**19,243**	**2,994**	**7,494**	**8,754**
Illinois	6,897	958	2,876	3,063	75,110	4,666	26,727	43,718	4,335	430	1,972	1,933
Indiana	3,010	522	1,140	1,348	41,714	3,407	14,632	23,676	1,804	229	745	830
Iowa	1,459	134	329	996	20,820	823	4,371	15,627	906	62	216	627
Michigan	4,845	1,122	1,796	1,927	58,745	9,269	18,110	31,365	2,991	564	1,221	1,205
Minnesota	3,099	557	932	1,610	37,696	3,152	10,080	24,465	1,864	237	616	1,010
Missouri	2,488	363	704	1,422	37,690	2,539	9,994	25,157	1,495	134	470	890
Ohio	5,855	1,303	2,354	2,198	79,841	10,077	31,493	38,271	3,532	607	1,556	1,369
Wisconsin	4,170	1,704	1,046	1,420	45,483	10,130	11,647	23,706	2,317	731	697	890
Great Plains	**2,999**	**355**	**708**	**1,936**	**42,855**	**2,053**	**9,770**	**31,032**	**1,827**	**147**	**463**	**1,216**
Kansas	1,362	231	417	714	19,316	1,395	5,837	12,084	813	93	274	446
Nebraska	961	75	214	672	13,383	385	2,783	10,215	596	32	141	424
North Dakota	307	22	32	254	4,500	138	452	3,910	189	9	21	160
South Dakota	369	27	46	297	5,657	135	699	4,823	228	13	28	187
South	**34,559**	**10,189**	**12,270**	**12,100**	**498,420**	**93,753**	**188,420**	**216,247**	**22,150**	**6,301**	**8,194**	**7,656**
Southcentral	**13,992**	**3,644**	**4,601**	**5,746**	**209,935**	**36,629**	**70,909**	**102,397**	**8,615**	**1,974**	**3,039**	**3,602**
Arkansas	1,395	628	255	513	16,680	3,349	4,135	9,197	675	195	166	315
Louisiana	1,069	157	265	647	19,617	1,762	4,785	13,070	679	100	173	406
New Mexico	520	87	207	226	8,739	660	3,437	4,642	353	72	137	145
Oklahoma	1,352	449	322	580	24,603	5,498	7,158	11,947	819	247	212	359
Texas	9,656	2,324	3,551	3,781	140,295	25,360	51,394	63,541	6,088	1,360	2,351	2,377
Southeast	**20,568**	**6,545**	**7,669**	**6,354**	**288,486**	**57,124**	**117,511**	**113,850**	**13,535**	**4,327**	**5,155**	**4,054**
Alabama	1,681	437	668	576	26,804	4,521	10,617	11,666	1,148	353	434	360
Florida	9,997	3,025	4,051	2,921	147,795	32,966	62,632	52,197	7,076	2,463	2,747	1,866
Georgia	4,726	1,143	1,782	1,800	62,493	7,362	25,620	29,511	3,020	644	1,213	1,162
Mississippi	977	296	190	491	14,236	1,789	3,309	9,138	548	120	122	306
South Carolina	3,187	1,644	978	565	37,157	10,486	15,333	11,337	1,745	747	638	359
West	**37,326**	**8,829**	**16,335**	**12,162**	**485,467**	**78,612**	**219,879**	**186,976**	**24,830**	**5,859**	**11,112**	**7,859**
Mountain	**9,824**	**1,473**	**4,750**	**3,601**	**132,982**	**10,557**	**64,279**	**58,146**	**6,449**	**954**	**3,185**	**2,309**
Arizona	3,206	826	1,508	873	43,882	5,796	23,198	14,888	2,081	506	1,013	563
Colorado	3,085	294	1,612	1,179	37,630	1,554	19,059	17,017	2,019	178	1,083	758
Idaho	853	107	250	496	12,000	923	3,534	7,543	576	91	164	320
Montana	357	57	68	232	5,988	492	931	4,564	219	31	43	145
Nevada	1,248	16	929	303	17,324	121	12,433	4,770	844	13	633	198
Utah	901	165	316	420	13,577	1,614	4,388	7,575	600	130	206	264
Wyoming	174	8	68	98	2,581	57	736	1,788	109	4	44	61
Pacific	**27,502**	**7,356**	**11,585**	**8,561**	**352,485**	**68,055**	**155,600**	**128,830**	**18,382**	**4,905**	**7,927**	**5,550**
Alaska	159	18	53	88	2,110	146	467	1,497	104	10	36	58
California	20,362	4,736	9,371	6,255	253,977	36,236	126,428	91,313	13,656	3,165	6,429	4,063
Hawaii	745	254	320	171	11,166	3,394	4,492	3,281	531	200	220	112
Oregon	3,173	1,711	660	802	43,980	21,632	9,171	13,177	2,010	1,048	448	515
Washington	3,064	636	1,181	1,246	41,251	6,647	15,042	19,561	2,080	482	795	803
Total All Regions	**147,828**	**34,578**	**57,774**	**55,475**	**1,964,339**	**300,677**	**753,557**	**910,104**	**95,084**	**20,796**	**39,013**	**35,275**

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce)

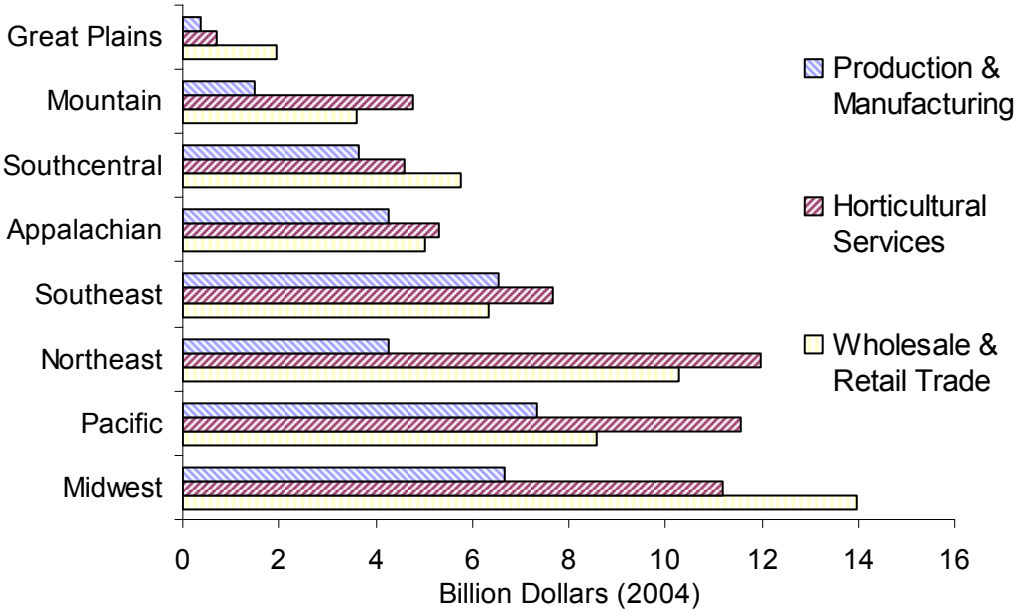


Figure 3-1. Output Impacts of the U.S. Green Industry by Region and Industry Group, 2002

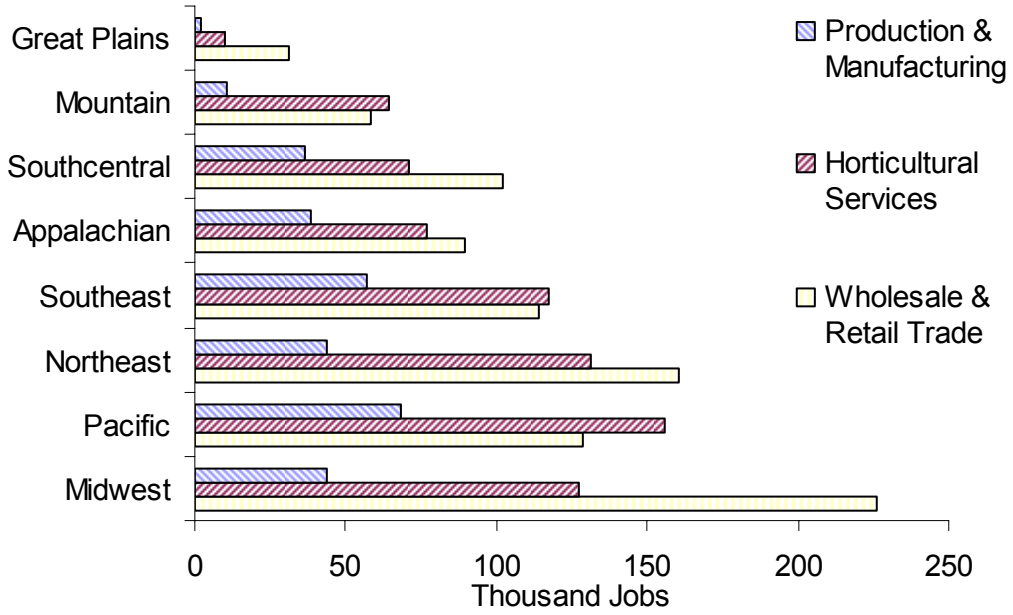


Figure 3-2. Employment Impacts of the U.S. Green Industry by Region and Industry Group, 2002

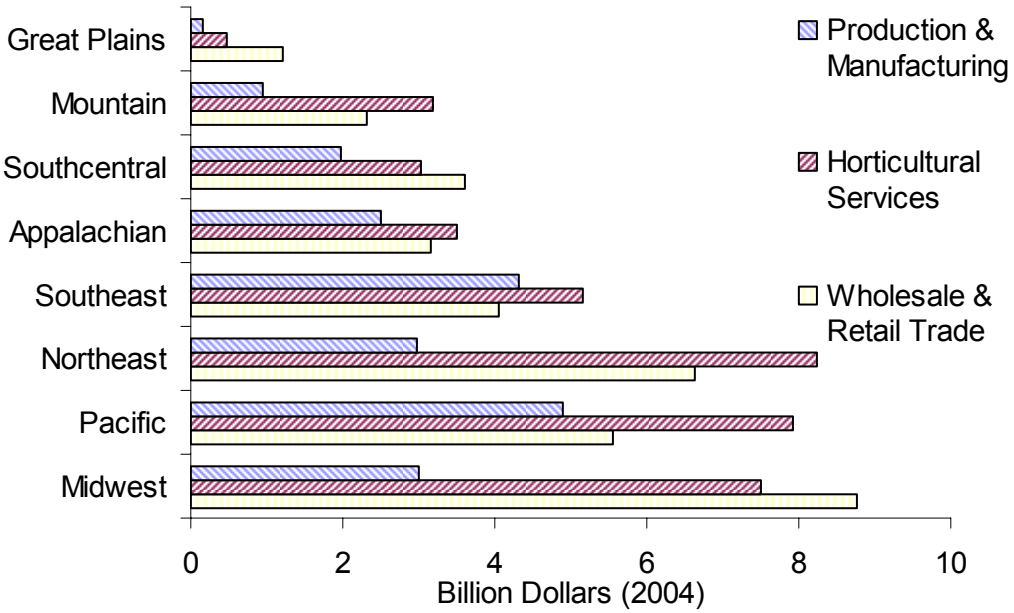


Figure 3-3. Value added Impacts of the U.S. Green Industry by Region and Industry Group, 2002

Table 3-3. Output Impacts of the U.S. Green Industry by Sector and State, 2002

State	Nursery & Green-house	Lawn & Garden Equip. & Grnhse. Mfg	Land-scaping Services	Land-scape Archi-tecture	Horticul-tural Whole-salers	Garden Equip-ment Whole-sale	Lawn & Garden Stores	Building Material Supply Stores	Florists	Food & beverage stores	General merch-andise stores	Total All Sectors
						Output Impacts ($Mn)*						
Alabama	411	26	627	41	26	47	189	117	75	24	98	1,681
Alaska	18	0	46	6	2	0	19	29	12	5	21	159
Arizona	596	230	1,393	115	56	49	311	194	89	60	114	3,206
Arkansas	73	555	240	15	7	75	232	64	59	11	66	1,395
California	4,470	266	8,269	1,102	485	297	2,517	1,210	725	355	665	20,362
Colorado	289	5	1,408	204	42	76	521	247	126	51	117	3,085
Connecticut	453	0	1,080	62	29	34	329	159	114	35	54	2,350
Delaware	53	0	213	16	6	16	60	31	28	6	19	448
Florida	3,006	19	3,801	250	446	119	748	617	439	153	399	9,997
Georgia	567	577	1,664	118	101	156	690	384	198	67	204	4,726
Hawaii	254	0	274	46	10	7	41	30	41	10	31	745
Idaho	107	0	239	11	3	52	337	46	21	8	29	853
Illinois	432	526	2,621	256	224	284	1,288	479	427	82	278	6,897
Indiana	276	246	1,096	44	25	106	654	211	166	33	152	3,010
Iowa	106	28	306	23	7	183	569	94	60	20	62	1,459
Kansas	114	118	378	39	16	119	357	85	57	17	63	1,362
Kentucky	132	6	353	20	16	45	385	102	87	21	90	1,257
Louisiana	149	7	244	21	14	49	271	110	79	24	100	1,069
Maine	52	4	227	26	2	10	81	44	30	11	23	509
Maryland	601	3	1,720	87	54	47	427	222	196	60	107	3,524
Massachusetts	199	1	1,558	230	73	31	417	291	263	74	102	3,239
Michigan	910	211	1,561	236	65	117	756	380	286	63	258	4,845
Minnesota	310	247	877	56	40	220	728	239	207	43	134	3,099
Mississippi	56	241	168	22	15	43	249	60	48	11	65	977
Missouri	142	221	676	27	33	107	674	216	169	37	186	2,488
Montana	57	0	62	6	3	32	122	29	22	6	18	357
Nebraska	40	35	199	16	4	127	391	61	39	11	37	961
Nevada	14	1	897	32	9	19	109	66	35	18	48	1,248
New Hampshire	101	3	298	18	8	13	121	70	50	13	35	729
New Jersey	562	18	1,982	146	198	54	443	326	259	93	131	4,210
New Mexico	87	0	184	23	3	12	80	53	26	10	41	520
New York	534	217	1,693	194	156	100	927	528	509	142	265	5,265
North Carolina	1,638	118	1,803	122	41	152	592	311	160	52	165	5,155
North Dakota	18	4	31	1	1	95	109	21	13	3	11	307
Ohio	756	547	2,248	107	159	255	821	355	294	78	237	5,855
Oklahoma	429	20	305	17	19	46	252	86	74	15	88	1,352
Oregon	1,693	18	602	58	28	58	407	114	66	29	100	3,173
Pennsylvania	1,321	56	1,909	183	76	97	830	407	364	105	242	5,589
Rhode Island	67	0	226	7	9	3	18	28	26	7	12	403
South Carolina	445	1,199	933	44	32	29	220	120	63	23	78	3,187
South Dakota	23	4	41	4	8	48	181	24	15	5	14	369
Tennessee	548	1,193	910	65	26	77	524	198	137	33	142	3,854
Texas	2,276	48	3,179	372	169	276	1,505	703	454	157	517	9,656
Utah	160	5	302	14	9	28	174	94	39	18	57	901
Vermont	34	3	111	9	3	10	75	26	20	6	6	302
Virginia	373	211	1,760	109	29	73	647	244	236	57	174	3,914
Washington	630	6	1,096	85	61	78	606	196	113	52	140	3,064
West Virginia	40	0	141	6	4	6	62	37	35	7	32	371
Wisconsin	424	1,281	957	89	25	154	751	214	129	35	112	4,170
Wyoming	8	0	62	5	2	14	39	13	18	3	9	174
Total All States	26,053	8,526	52,971	4,803	2,879	4,146	22,859	9,982	7,195	2,263	6,150	147,828

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

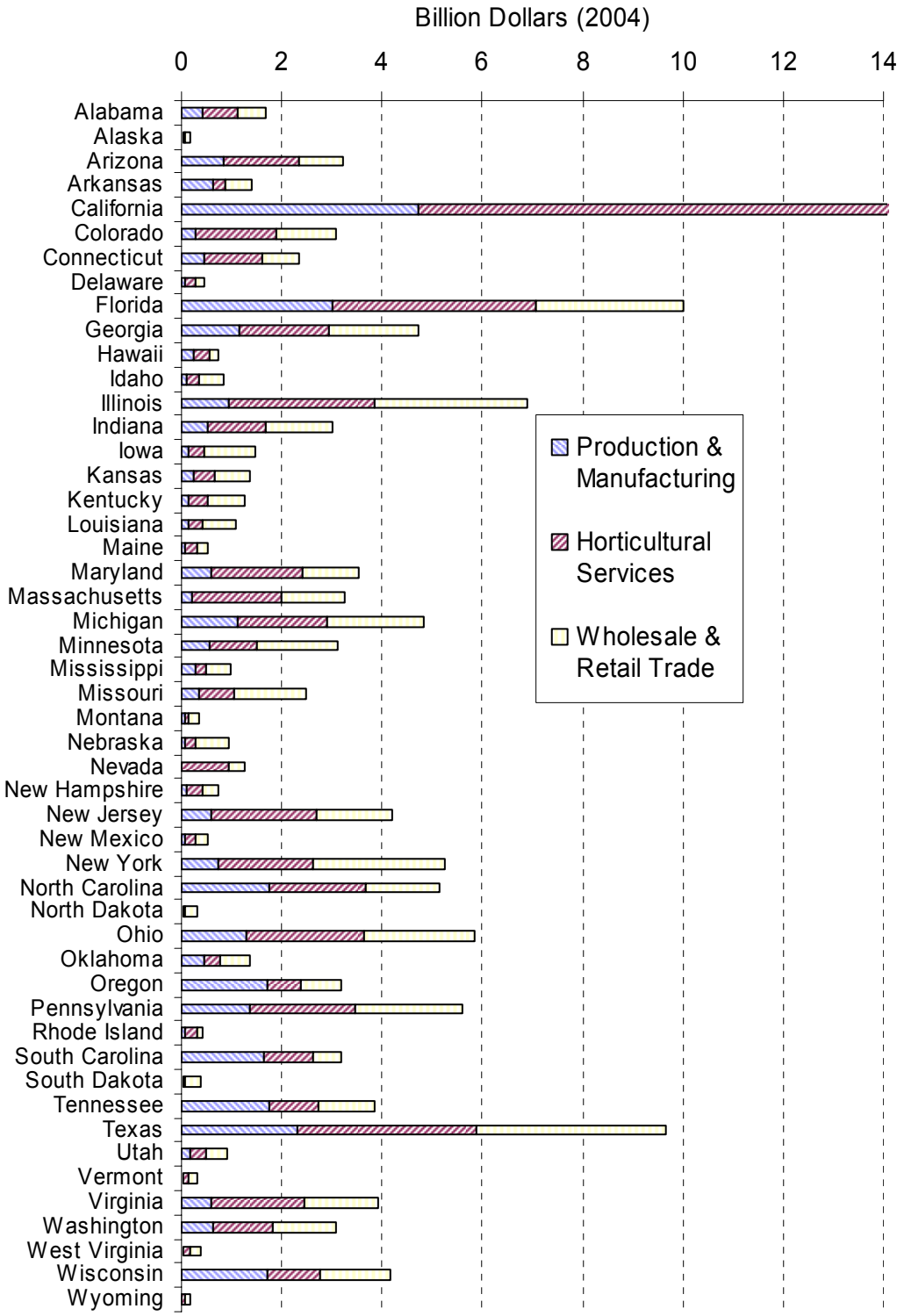


Figure 3-4. Output Impacts of the U.S. Green Industry by State and Industry Group, 2002

Table 3-4. Employment Impacts of the U.S. Green Industry by Sector and State, 2002

State	Nursery & Green-house	Lawn & Garden Equip. & Grnhse. Mfg	Land-scaping Services	Land-scape Architec-ture	Horticul-tural Whole-salers	Garden Equip-ment Whole-sale	Lawn & Garden Stores	Building Material Supply Stores	Florists	Food & beverage stores	General merchan-dise stores	Total All Sectors
						Employment Impacts (jobs)						
Alabama	4,521	137	10,027	590	809	529	3,786	1,753	2,610	457	1,722	26,804
Alaska	143	3	400	68	53	3	307	381	376	80	297	2,110
Arizona	4,781	1,015	21,970	1,228	1,534	454	4,945	2,548	2,923	785	1,700	43,882
Arkansas	733	2,616	3,980	155	257	753	3,844	929	2,014	233	1,167	16,680
California	35,268	968	115,134	11,294	11,793	2,536	31,352	13,822	19,131	4,195	8,484	253,977
Colorado	1,529	26	17,234	1,825	1,095	746	6,990	2,697	3,283	636	1,571	37,630
Connecticut	4,796	11	10,691	523	655	264	4,479	1,685	2,604	497	822	27,026
Delaware	375	0	3,010	184	179	170	876	430	716	99	320	6,359
Florida	32,821	145	59,935	2,697	9,868	1,195	12,661	8,175	11,951	2,477	5,870	147,795
Georgia	4,690	2,672	24,250	1,370	2,169	1,560	11,400	4,687	5,495	1,156	3,045	62,493
Hawaii	3,394	0	4,038	454	343	49	685	440	1,153	155	456	11,166
Idaho	919	4	3,404	130	99	539	4,559	739	950	154	502	12,000
Illinois	2,555	2,110	24,818	1,909	4,327	2,597	15,641	5,378	10,571	1,217	3,986	75,110
Indiana	2,192	1,215	14,155	477	793	1,018	10,323	2,914	5,477	627	2,524	41,714
Iowa	646	176	4,158	213	252	1,844	8,092	1,391	2,582	407	1,059	20,820
Kansas	851	544	5,330	507	496	1,150	5,791	1,159	2,085	327	1,076	19,317
Kentucky	1,911	30	5,370	274	538	494	6,725	1,474	2,832	430	1,571	21,649
Louisiana	1,712	50	4,414	370	539	602	5,256	1,730	2,700	497	1,746	19,617
Maine	642	22	2,998	254	58	117	1,508	621	995	218	391	7,826
Maryland	5,650	16	21,702	894	1,293	457	6,641	2,607	4,905	817	1,744	46,725
Massachusetts	3,406	4	14,659	1,890	1,474	240	5,038	2,978	5,364	1,046	1,453	37,553
Michigan	8,526	743	16,066	2,045	1,576	1,187	10,617	4,675	8,354	1,062	3,893	58,745
Minnesota	1,983	1,169	5,891	510	1,039	2,036	10,018	2,789	5,870	742	1,972	34,018
Mississippi	657	1,132	2,995	314	598	439	3,928	951	1,826	252	1,145	14,236
Missouri	1,639	901	9,667	327	1,244	1,133	12,056	2,929	4,558	619	2,618	37,690
Montana	491	1	872	60	86	375	2,372	465	861	105	301	5,988
Nebraska	159	226	2,626	157	162	1,305	5,576	871	1,426	236	639	13,383
Nevada	110	11	12,067	366	186	190	1,745	801	932	236	679	17,324
New Hampshire	1,444	26	3,428	157	160	128	1,844	852	1,353	231	532	10,153
New Jersey	6,968	74	21,878	1,340	3,590	444	5,907	3,461	6,095	1,247	1,925	52,929
New Mexico	656	4	2,410	316	100	143	1,772	739	1,039	173	676	8,028
New York	4,525	819	17,198	1,507	3,093	920	11,640	5,890	10,688	2,113	3,721	62,113
North Carolina	12,478	514	27,658	1,414	1,199	1,141	10,365	4,018	4,947	921	2,818	67,472
North Dakota	119	19	442	10	32	1,059	1,652	314	552	76	225	4,500
Ohio	7,676	2,401	30,400	1,093	3,416	2,787	13,103	4,645	8,979	1,389	3,953	79,841
Oklahoma	5,405	94	6,909	249	674	510	4,951	1,245	2,670	318	1,579	24,603
Oregon	21,554	78	8,436	735	719	546	6,381	1,388	2,249	460	1,435	43,980
Pennsylvania	13,562	241	23,589	1,844	2,167	944	13,186	4,859	9,845	1,776	3,816	75,829
Rhode Island	895	0	2,404	70	214	30	265	331	752	121	209	5,289
South Carolina	4,882	5,605	14,770	563	936	330	4,249	1,769	2,244	479	1,329	37,157
South Dakota	109	26	647	52	240	497	2,693	379	647	112	255	5,657
Tennessee	10,757	5,847	12,865	929	791	748	9,437	2,521	3,910	636	2,373	50,812
Texas	25,038	322	36,804	3,959	4,445	2,768	25,386	8,645	12,248	2,374	7,675	129,664
Utah	1,583	31	4,238	150	286	347	3,175	1,227	1,347	310	885	13,577
Vermont	310	12	1,264	81	62	115	1,196	334	609	125	119	4,225
Virginia	4,956	815	24,768	1,292	863	762	11,014	3,030	5,914	879	2,612	56,905
Washington	6,616	31	14,196	846	1,577	730	8,956	2,374	3,320	720	1,885	41,251
West Virginia	1,087	4	2,245	58	146	61	1,328	582	1,316	183	620	7,631
Wisconsin	3,774	6,355	10,765	882	691	1,482	11,567	2,795	4,634	654	1,883	45,483
Wyoming	49	8	682	53	55	143	639	173	552	60	166	2,581
Total All States	261,408	39,270	689,854	48,683	68,969	40,617	347,916	123,591	200,451	35,117	93,443	1,949,321

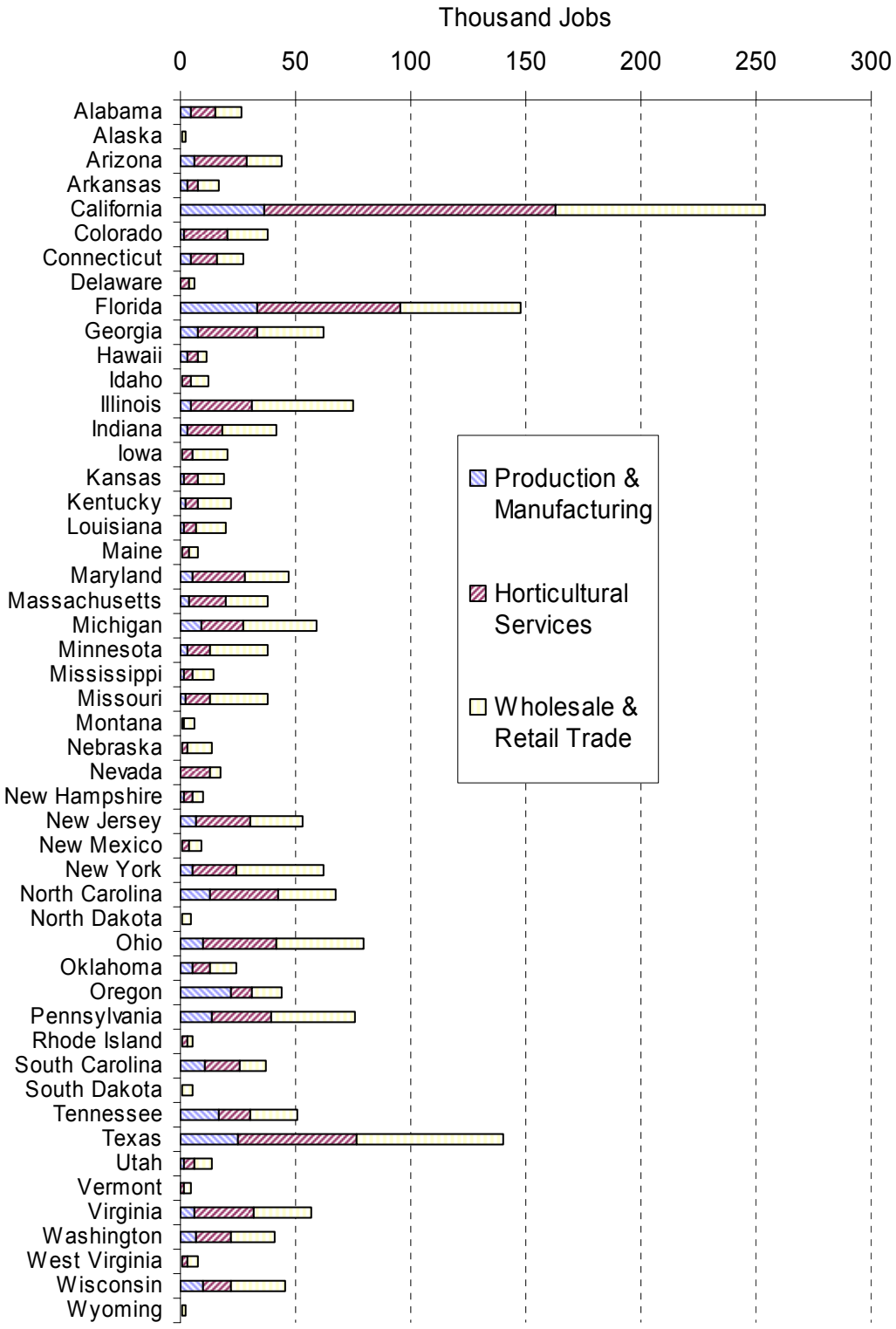


Figure 3-5. Employment Impacts of the U.S. Green Industry by State and Industry Group, 2002

Table 3-5. Value Added Impacts of the U.S. Green Industry by Sector and State, 2002

State	Nursery & Green-house	Lawn & Garden Equip. & Grnhse. Mfg	Green-house Mfg	Land-scaping Services	Land-scape Architec-ture	Horticul-tural Whole-salers	Garden Equip-ment Whole-sale	Lawn & Garden Stores	Building Material Supply Stores	Florists	Food & beverage stores	General merchan-dise stores	Total All Sectors
						Value Added Impacts ($Mn)*							
Alabama	345	9	4	405	29	17	31	122	75	38	14	63	1,148
Alaska	10	0	0	31	5	1	0	13	19	6	3	14	104
Arizona	435	71	2	929	84	37	32	204	127	51	38	74	2,081
Arkansas	58	137	2	154	11	4	49	146	40	28	6	41	675
California	3,079	86	10	5,644	785	324	199	1,657	797	424	226	437	13,656
Colorado	177	2	1	939	144	28	50	340	161	70	32	76	2,019
Connecticut	375	0	0	742	46	19	23	223	107	66	23	36	1,659
Delaware	44	0	0	138	11	4	10	39	20	15	4	13	297
Florida	2,456	7	5	2,562	185	294	79	488	402	251	92	259	7,076
Georgia	468	176	5	1,127	86	67	103	453	252	113	41	133	3,020
Hawaii	200	0	0	186	33	7	5	28	21	24	7	21	531
Idaho	91	0	0	156	8	2	34	220	30	10	5	19	576
Illinois	268	162	7	1,786	186	147	187	826	308	238	50	177	4,335
Indiana	156	73	4	714	32	17	70	412	133	84	19	95	1,804
Iowa	53	10	2	199	17	5	121	362	60	30	12	39	906
Kansas	55	39	1	246	27	11	79	225	53	29	10	40	813
Kentucky	110	2	1	230	15	11	30	245	65	44	12	57	821
Louisiana	97	3	2	158	15	9	32	174	71	42	14	64	679
Maine	38	1	1	147	18	2	7	53	29	15	7	15	331
Maryland	477	1	0	1,166	64	37	31	288	150	115	39	72	2,440
Massachusetts	122	0	0	1,062	163	49	21	279	194	155	46	68	2,159
Michigan	479	85	2	1,060	161	43	77	485	244	155	38	164	2,991
Minnesota	154	84	1	576	40	26	145	464	152	112	26	85	1,864
Mississippi	52	68	2	106	16	10	28	158	38	24	7	41	548
Missouri	77	57	3	450	20	22	71	430	138	89	22	118	1,495
Montana	31	0	0	39	4	2	21	78	18	11	3	12	219
Nebraska	18	13	6	129	12	3	84	248	39	20	7	23	596
Nevada	13	1	1	610	23	6	13	73	44	20	11	32	844
New Hampshire	61	2	2	195	13	5	8	79	45	27	8	22	465
New Jersey	430	6	1	1,354	105	133	36	297	218	150	58	87	2,875
New Mexico	72	0	0	121	17	2	8	53	34	14	6	27	353
New York	374	64	2	1,219	144	105	67	621	354	298	89	177	3,511
North Carolina	1,347	40	5	1,173	88	27	101	382	201	87	31	106	3,583
North Dakota	8	1	0	20	1	1	61	69	14	6	2	7	189
Ohio	436	171	3	1,479	77	101	163	524	226	159	46	150	3,532
Oklahoma	241	6	1	199	13	12	31	159	54	38	9	56	819
Oregon	1,043	5	1	406	42	19	38	265	74	36	18	66	2,010
Pennsylvania	904	20	3	1,300	130	50	65	531	260	195	63	154	3,672
Rhode Island	41	0	0	151	5	6	2	12	19	14	5	8	262
South Carolina	394	353	1	606	32	21	19	143	78	33	14	50	1,745
South Dakota	12	2	1	25	3	6	32	114	15	7	3	9	228
Tennessee	301	387	5	603	46	17	51	335	127	73	20	91	2,050
Texas	1,340	20	18	2,086	264	111	181	962	449	247	94	332	6,088
Utah	128	2	1	195	10	6	18	111	60	21	10	37	600
Vermont	24	1	0	72	6	2	7	49	17	10	4	4	196
Virginia	248	60	1	1,170	80	20	48	427	161	130	35	115	2,493
Washington	480	2	1	734	61	41	52	397	128	61	33	92	2,080
West Virginia	13	0	0	92	4	3	4	39	24	17	4	20	220
Wisconsin	238	492	3	633	64	17	102	478	136	66	20	70	2,317
Wyoming	4	0	0	40	4	1	9	25	8	9	2	6	109
Total All States	18,076	2,720	110	35,564	3,449	1,907	2,737	14,806	6,491	3,977	1,385	3,973	95,084

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

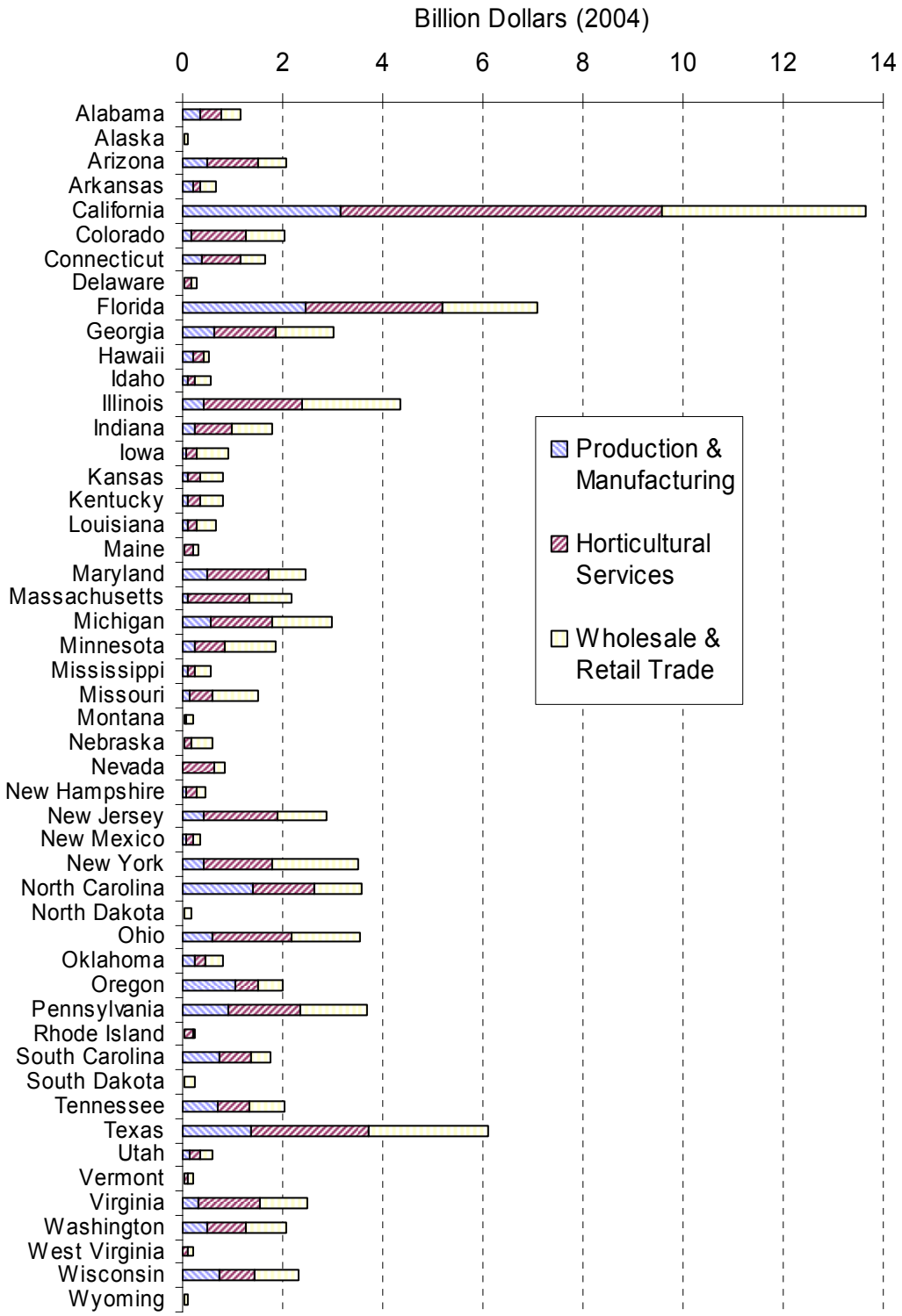


Figure 3-6. Value Added Impacts of the U.S. Green Industry by State and Industry Group, 2002

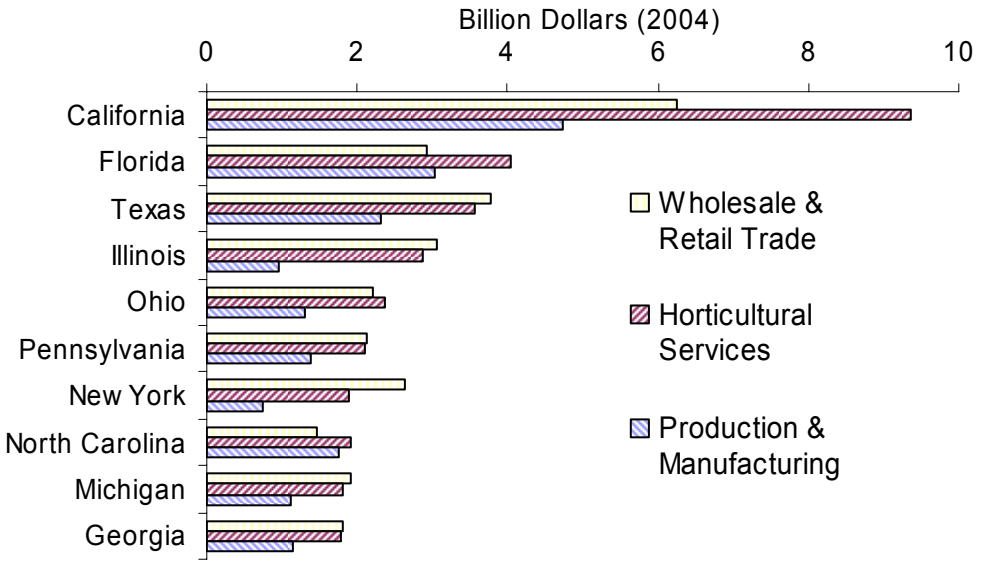


Figure 3-7. Output Impacts of the U.S. Green Industry in Leading States, 2002

Figure 3-8. Employment Impacts of the U.S. Green Industry in Leading States, 2002

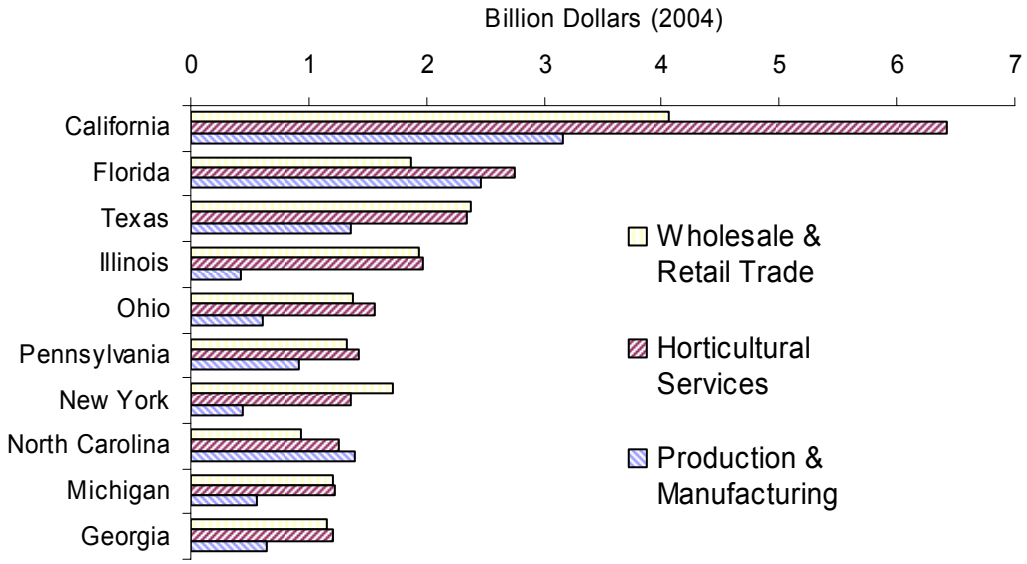


Figure 3-9. Value Added Impacts of the U.S. Green Industry in Leading States, 2002

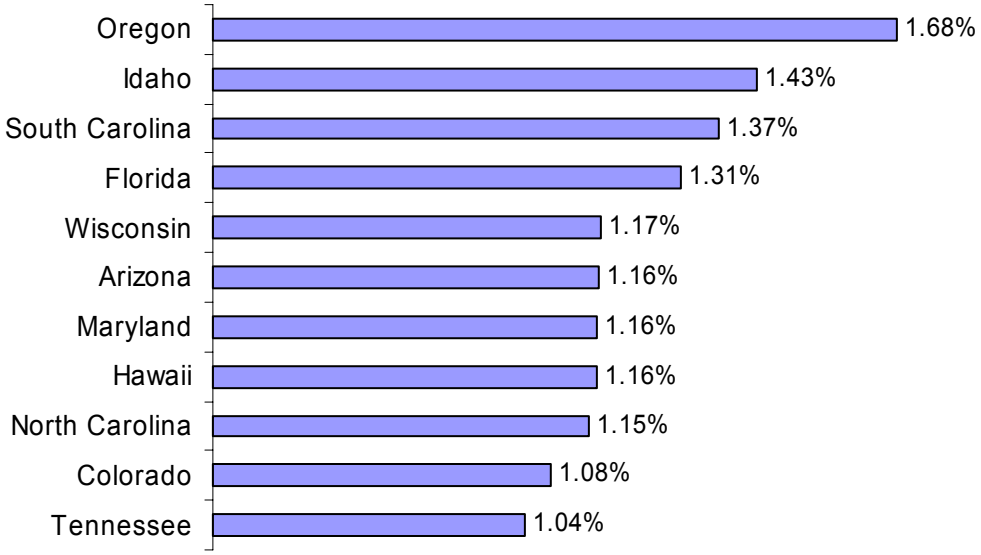


Figure 3-10. Rank Order of States by Green Industry Share of Gross State Product, 2002

Table 3-6. Green Industry Share of Gross State Product, 2002

State	Total Value Added Impact of Green Industry (Mn$)*	Gross State Product (Mn$)*	Green Industry Share of GSP
Alabama	1,148	130,678	0.878%
Alaska	104	30,917	0.336%
Arizona	2,081	178,773	1.164%
Arkansas	676	74,857	0.902%
California	13,656	1,423,454	0.959%
Colorado	2,019	186,712	1.081%
Connecticut	1,659	172,490	0.962%
Delaware	297	49,069	0.606%
Florida	7,076	541,684	1.306%
Georgia	3,020	318,276	0.949%
Hawaii	531	45,789	1.160%
Idaho	576	40,127	1.434%
Illinois	4,335	505,925	0.857%
Indiana	1,804	213,287	0.846%
Iowa	906	102,230	0.886%
Kansas	813	93,151	0.873%
Kentucky	821	127,259	0.645%
Louisiana	679	136,940	0.496%
Maine	331	40,628	0.815%
Maryland	2,440	210,096	1.161%
Massachusetts	2,159	299,813	0.720%
Michigan	2,991	365,584	0.818%
Minnesota	1,864	208,204	0.895%
Mississippi	548	71,950	0.761%
Missouri	1,495	195,176	0.766%
Montana	219	24,741	0.886%
Nebraska	596	63,443	0.940%
Nevada	844	84,486	0.999%
New Hampshire	465	48,338	0.962%
New Jersey	2,875	395,642	0.727%
New Mexico	353	55,693	0.635%
New York	3,511	824,295	0.426%
North Carolina	3,583	312,435	1.147%
North Dakota	189	20,585	0.920%
Ohio	3,532	404,025	0.874%
Oklahoma	819	98,998	0.827%
Oregon	2,010	119,824	1.678%
Pennsylvania	3,672	446,408	0.823%
Rhode Island	262	38,493	0.682%
South Carolina	1,745	127,334	1.370%
South Dakota	228	26,0201	0.877%
Tennessee	2,050	197,860	1.036%
Texas	6,088	804,935	0.756%
Utah	600	75,944	0.790%
Vermont	196	20,402	0.961%
Virginia	2,493	299,294	0.833%
Washington	2,080	242,421	0.858%
West Virginia	220	47,371	0.464%
Wisconsin	2,317	198,410	1.168%
Wyoming	109	21,111	0.517%
Total All States	95,084	10,830,712	0.878%

* Expressed in 2004 dollars using GDP Implicit Price Deflator.
Source for GSP: U.S. Dept. Commerce, Bureau of Economic Analysis

4. Results for Production and Manufacturing Sectors

Production and manufacturing activity in the Green Industry includes the sectors for nursery and greenhouse, lawn and garden equipment manufacturers, and greenhouse manufacturers (prefabricated metal buildings). The activities included within each sector are indicated in Table 4-1.

Nursery, Greenhouse and Floriculture Production (NAICS 1114). This sector is comprised of establishments primarily engaged in growing nursery products, nursery stock, shrubbery, bulbs, fruit stock, sod, and so forth, under cover or in open fields and/or growing short rotation woody trees with a growth and harvest cycle of 10 years or less for pulp or tree stock. As a cross reference to other related industry sectors, establishments primarily engaged in growing vegetable and melon bedding plants are classified under Vegetable and Melon Farming (NAICS 11121); establishments primarily engaged in operating timber tracts (i.e., growing cycle greater than 10 years) are classified under Timber Tract Operations (113110); establishments primarily engaged in producing seedling trees for planting for commercial timber production are classified under Forest Nurseries and Gathering of Forest Products (113210); establishments primarily engaged in retailing nursery, tree stock, and floriculture products primarily purchased from others are classified under Nursery, Garden Center, and Farm Supply Stores (NAICS 444220).

Lawn and Garden Equipment Manufacturing (NAICS 333112). This sector is comprised of establishments primarily engaged in manufacturing of powered lawn mowers, lawn and garden tractors, and other home lawn and garden equipment such as tillers, shredders, and yard vacuums and blowers. As a cross reference to other related industry sectors, establishments primarily engaged in manufacturing commercial mowing and other turf and grounds care equipment are classified under Farm Machinery And Equipment Manufacturing (NAICS 333111); establishments primarily engaged in manufacturing non-powered lawn and garden shears, edgers, pruners, and lawnmowers are classified under Cutlery and Handtool Manufacturing (NAICS 33221).

Table 4-1. Products Included in the Production and Manufacturing Sectors of the Green Industry

Industry Sector/Subsector (NAICS code)		Products
Nursery & Greenhouse (1114)	Nursery and Tree Production (111421)	Nursery products, nursery stock, shrubbery, bulbs, fruit stock, sod grown under cover or in open fields, short rotation woody trees with a growing and harvesting cycle of ten years or less.
	Floriculture Production (111422)	Cut flowers, roses, cut cultivated greens, potted flowering plants, foliage plants, and flower seeds grown under cover and in open fields.
Lawn & garden tractor and home lawn and garden equipment manufacturing (333112)		Manufacturing of powered lawn mowers, lawn and garden tractors, and other home lawn and garden equipment such as tillers, shredder and yard vacuums and blowers.
Greenhouse manufacturing (Prefab. metal building and component manufacturing, 332311)		Manufacturing prefabricated metal buildings, panels and sections.

The number of establishments, employment, payroll, and sales receipts for the production and manufacturing sectors of the Green Industry in 2002 are shown in Table 4-2. There were a total of 56,233 business establishments involved in these sectors of the industry, mostly as nursery and greenhouse producers, with a relatively small number of lawn and garden equipment and greenhouse manufacturing firms (145 and 18, respectively). Total sales receipts in 2002 were $23.0 billion (Bn), including $16.4 Bn for nurseries, $6.5 Bn for lawn & garden equipment manufacturers, and $121 Mn for greenhouse manufacturers. The production and manufacturing sectors represented about 16 percent of the overall Green Industry sales receipts. Nursery and greenhouse firms are typically rather small, with average annual sales of $291,800, compared to average sales of $44.9 Mn for lawn and garden equipment manufacturers and $5.7 Mn for greenhouse manufacturers. For lawn and garden equipment manufacturers, total reported employment was 22,201 employees and total payroll was $681 million (Mn). Employment and payroll for greenhouse manufacturers were estimated in proportion to the

sales of greenhouses within the larger industry group of Prefabricated Building Manufacturers. Employment for the nursery and greenhouse sector totaled 150,543 employees, with an annual payroll amounting to $4.5 Bn.

Table 4-2. Establishments, Employment, Payroll and Sales in Production and Manufacturing Sectors of the U.S. Green Industry, 2002

Industry Sector	Establish-ments	Paid Employees	Annual Payroll ($Mn)	Sales Receipts ($Mn)
Nursery & Greenhouse	56,070	150,543	4,459	16,362
Lawn & Garden Equipment Manufacturing	145	22,201	681	6,517
Greenhouse Manufacturing*	18	659	21,756	121
Total Production/Manufacturing	56,233	173,043	26,839	23,000

* Payroll and employment estimated proportional to merchandise or product line sales as share of total sales.
Sources: 2002 Economic Census (US Census Bureau), and 2002 Census of Agriculture (USDA).

Economic impact estimates for the production and manufacturing sectors are summarized in Table 4-3. Total impacts for this industry group included output of $34.6 billion (Bn), employment impacts of 300,677 jobs, value added of $20.8 Bn, labor income of $11.0 Bn, and indirect business taxes of $784 Mn. The nursery and greenhouse sector was the largest in this group by all measures, with $26.1 Bn in output impacts, 261,408 jobs, $18.1 Bn in value added, $9.6 Bn in labor income, and $647 Mn in indirect business taxes. The lawn and garden equipment manufacturing sector had total impacts of $8.3 Bn in output, 37,343 jobs, $2.6 Bn in value added, $1.3 Bn in labor income, and $129 Mn in indirect business taxes. Greenhouse manufacturing had total output impacts of $244 Mn, employment impacts of 1,927 jobs, value added impacts of $110 Mn, labor income impacts of $78 Mn, and indirect business tax impacts of $7 Mn. Collectively, the production and manufacturing sectors represented 23 percent of overall Green Industry output impacts, 15 percent of employment impacts, and 22 percent of value added impacts.

Table 4-3. Economic Impacts of the Production and Manufacturing Sectors of the U.S. Green Industry, 2002

Industry Sector	Output ($Mn)*	Employ-ment (jobs)	Value Added ($Mn)*	Labor Income ($Mn)*	Indirect Business Taxes ($Mn)*
Nursery & Greenhouse	26,053	261,408	18,076	9,612	647
Lawn & Garden Equipment Manufacturing.	8,281	37,343	2,610	1,346	129
Greenhouse Manufacturing	244	1,927	110	78	7
Total Production & Manufacturing	34,578	300,677	20,796	11,037	784

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce)

Nursery and Greenhouse Sector

Total economic impacts and other characteristics of the nursery and greenhouse industry sector are summarized by state in Table 4-4. For the nursery and greenhouse sector, the top five individual states in terms of output impacts were California ($4.47 Bn), Florida ($3.01 Bn), Texas ($2.28 Bn), Oregon ($1.69 Bn), and North Carolina ($1.64 Bn). Collectively, these top five states accounted for 30 percent of farms, 50 percent of industry output impacts, 49 percent of employment impacts, and 51 percent of value added impacts. The second tier of states with large output impacts included Pennsylvania ($1.32 Bn), Michigan ($910 Mn), Ohio ($756 Mn), Washington ($630 Mn), and Maryland ($602 Mn). Combined, these top 10 states represented 66 percent of total industry output impacts, while the top 20 states represented 86 percent. The two top states of California and Florida both had over 4,000 nursery and greenhouse farms, while Oregon and Pennsylvania had over 3,000 farms, and Texas, North Carolina, Michigan, Ohio, Tennessee and New York all had over 2,000 farms. The states of California and Florida had value added impacts of $3.08 Bn and $2.46 Bn, respectively. The employment impacts

represented an average of 15.4 jobs per million dollars output by the nursery and greenhouse sector, and the value added impacts amounted to 69 percent of total output impacts. Total economic impacts are influenced by the proportion of output sold outside the region ("export share"), which varied from a high of 93 percent for Hawaii to less than 5 percent for Colorado.

Lawn and Garden Equipment and Greenhouse Manufacturing Sectors

Total economic impacts of the lawn and garden equipment manufacturing industry sector are summarized by state in Table 4-5. For the this sector, the top five individual states in terms of output impacts were Wisconsin ($1.27 Bn), South Carolina ($1.20 Bn), Tennessee ($1.18 Bn), Georgia ($565 Mn) and Arkansas ($549 Mn). These top five states accounted for 19 percent of industry firms, 58 percent of output impacts, 61 percent of employment impacts, and 59 percent of value added impacts. The second tier of states with large output impacts included Ohio ($539 Mn), Illinois ($511 Mn), Minnesota ($245 Mn), California ($244 Mn) and Indiana ($238 Mn). These top 10 states represented 79 percent of total industry output impacts, while the top 20 states represented 98 percent. These results indicate that this sector is more concentrated than the nursery and greenhouse sector. The top three states of Wisconsin, South Carolina and Tennessee each had employment impacts in excess of 5,000 jobs from this industry, and value added impacts exceeding $300 Mn. The employment impacts represented an average of 5.5 jobs per million dollars output by this sector, and the value added impacts amounted to 32 percent of total output impacts. The share of output exported from the state varied from a high of 57 percent (Iowa) to less than 10 percent for more than half of the states estimated.

Total economic impacts of the greenhouse manufacturing industry sector are summarized by state in Table 4-6. For the this sector, the top five individual states in terms of output impacts were Texas ($38 Mn), California ($21 Mn), Nebraska ($15 Mn), Illinois ($15 Mn) and Georgia ($12 Mn). These top five states accounted for 29 percent of industry firms, 42 percent of output impacts, 40 percent of employment impacts, and 43 percent of value added impacts. A second tier of states with large output impacts included North Carlina ($12 Mn), Tennessee ($10 Mn), Florida ($10 Mn), Alabama ($9 Mn) and Indiana ($8 Mn). These top 10 states represented 62 percent of total industry output impacts, while the top 20 states represented 84 percent. The top two states of Texas and California each had employment impacts in excess of 150 jobs from this industry, and value added impacts exceeding $10 Mn. The employment impacts represented an average of 15.3 jobs per million dollars output by this sector, and the value added impacts amounted to 45 percent of total output impacts. The share of output exported from the state was typically over 90 percent, and one states exported all (100%) of production.

Table 4-4. Economic Impacts of the U.S. Nursery and Greenhouse Sector by State, 2002

State	Number Farms	Output ($Mn)	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*	Export Share
California	4,423	3,286.6	4,470.3	35,268	3,079.0	1,733.1	87.7	20.7%
Florida	4,718	1,844.1	3,006.2	32,821	2,456.3	1,230.3	86.3	41.3%
Texas	2,137	1,381.4	2,275.6	25,038	1,340.0	771.0	57.4	39.1%
Oregon	3,039	806.9	1,692.6	21,554	1,042.6	700.7	49.4	77.7%
North Carolina	2,587	937.4	1,637.9	12,478	1,346.7	574.5	50.9	62.0%
Pennsylvania	3,073	732.7	1,321.3	13,562	904.1	541.3	36.5	56.7%
Michigan	2,185	628.7	910.1	8,526	479.4	15.6	16.3	34.3%
Ohio	2,678	562.7	755.9	7,676	435.7	236.0	12.1	28.6%
Washington	1,883	391.9	629.9	6,616	480.1	304.1	14.9	46.9%
Maryland	769	318.0	601.5	5,650	477.1	255.2	17.3	58.7%
Arizona	367	284.5	595.7	4,781	434.7	255.3	18.6	83.5%
Georgia	1,199	315.3	566.8	4,690	467.6	206.7	18.4	57.8%
New Jersey	1,828	356.9	562.0	6,968	430.3	231.2	14.9	51.5%
Tennessee	2,323	282.8	548.0	10,757	301.1	175.5	14.7	66.9%
New York	2,552	344.3	533.9	4,525	373.8	218.6	13.7	50.0%
Connecticut	685	245.8	452.7	4,796	374.7	208.1	13.9	76.1%
South Carolina	771	321.7	445.2	4,882	394.3	118.7	11.5	33.5%
Illinois	1,108	357.5	431.8	2,555	268.2	138.8	6.7	11.6%
Oklahoma	578	222.6	428.9	5,405	240.9	142.7	11.5	66.7%
Wisconsin	1,487	234.5	423.8	3,774	238.2	150.2	10.7	67.6%
Alabama	797	251.5	411.0	4,384	344.8	142.1	12.1	58.4%
Virginia	1,241	218.7	372.6	4,956	248.0	143.3	9.4	52.5%
Minnesota	983	224.4	310.2	1,983	153.6	91.2	5.6	24.9%
Colorado	535	261.4	289.5	1,529	176.6	103.0	3.1	4.5%
Indiana	1,117	187.5	276.2	2,192	155.9	85.7	5.8	38.0%
Hawaii	1,386	110.3	254.4	3,394	200.1	132.8	7.7	93.4%
Massachusetts	902	153.5	198.9	3,406	122.0	82.6	3.1	20.3%
Utah	275	119.4	160.0	1,583	128.4	74.9	3.1	20.2%
Louisiana	665	87.8	149.3	1,712	97.5	55.9	3.8	59.6%
Missouri	932	101.3	142.1	1,639	76.7	44.2	2.7	27.7%
Kentucky	1,193	96.1	132.4	1,911	109.7	54.2	3.1	35.4%
Kansas	369	57.6	113.6	851	54.6	33.6	3.1	80.1%
Idaho	458	66.3	107.0	919	90.6	55.7	2.7	52.4%
Iowa	554	77.6	106.3	646	52.6	27.9	1.9	33.1%
New Hampshire	337	53.7	101.1	1,444	61.1	39.8	2.7	70.4%
New Mexico	223	60.3	86.7	656	71.6	42.3	1.9	35.5%
Arkansas	330	47.0	72.8	733	57.5	27.5	1.9	52.9%
Rhode Island	225	37.6	67.0	895	41.5	25.6	1.7	80.5%
Montana	318	33.8	56.8	491	31.2	19.2	1.3	69.0%
Mississippi	390	47.3	55.6	657	52.0	21.7	1.2	14.3%
Delaware	129	33.3	53.4	375	44.4	18.5	1.5	62.4%
Maine	769	37.3	51.7	642	38.2	22.4	1.0	32.7%
Nebraska	355	34.3	40.0	159	18.5	10.5	0.4	12.5%
West Virginia	371	26.8	39.7	1,087	12.7	8.5	0.6	45.8%
Vermont	418	22.8	33.8	310	24.0	14.4	0.7	43.0%
South Dakota	119	18.4	22.8	109	11.7	6.1	0.3	22.0%
Alaska	111	12.7	18.0	143	10.2	5.5	0.4	41.9%
North Dakota	78	11.0	17.8	119	7.8	4.7	0.4	71.7%
Nevada	50	10.1	14.5	110	12.8	8.2	0.3	32.5%
Wyoming	50	6.4	7.8	49	4.4	2.7	0.1	20.2%
Total	56,070	16,362.4	26,052.9	261,408	18,075.9	9,612.4	647.1	

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Table 4-5. Economic Impacts of the U.S. Lawn & Garden Equipment Manufacturing Sector by State, 2002

State	Establish-ments	Employ-ment (jobs)	Annual Wages ($1000)*	Output ($Mn)*	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*	Export Share
Wisconsin	8	3,157	101	964	1,274	6,308	490	258	24	29.7%
South Carolina	3	3,157	101	964	1,196	5,585	352	213	18	27.6%
Tennessee	8	3,033	95	908	1,183	5,768	383	203	21	27.8%
Georgia	7	1,473	47	450	565	2,573	171	91	10	22.1%
Arkansas	3	1,473	47	450	549	2,572	135	72	7	28.7%
Ohio	9	1,473	47	450	539	2,340	168	87	7	23.0%
Illinois	7	1,473	47	450	511	2,006	155	78	7	9.5%
Minnesota	6	631	20	193	245	1,151	83	44	5	24.6%
California	8	591	23	220	244	813	75	38	3	9.5%
Indiana	12	778	21	199	238	1,149	69	36	3	17.9%
Mississippi	3	631	20	193	235	1,090	66	34	3	26.8%
Arizona	3	631	20	193	225	974	69	35	3	18.1%
Missouri	4	631	20	193	215	851	55	28	2	9.5%
New York	3	631	20	193	212	788	61	30	3	9.5%
Virginia	1	631	20	193	210	803	59	29	2	9.5%
Michigan	6	534	20	188	206	707	83	3	3	9.5%
Kansas	5	316	10	96	116	531	38	18	2	23.4%
North Carolina	3	316	10	96	106	413	35	17	1	9.5%
Pennsylvania	10	147	5	45	50	195	17	8	1	9.5%
Iowa	1	51	2	15	23	135	8	4	0	56.8%
Nebraska	2	51	2	15	20	99	7	4	0	29.6%
Alabama	3	51	2	15	17	65	5	2	0	9.5%
New Jersey	3	51	2	15	17	62	5	3	0	9.5%
Oklahoma	1	51	2	15	17	67	5	2	0	9.5%
Oregon	1	51	2	15	17	65	4	2	0	9.5%
Texas	5	29	1	9	10	39	2	1	0	9.5%
Florida	5	52	1	8	9	60	2	1	0	9.5%
Washington	4	16	0	5	5	19	2	1	0	9.5%
Total	145	22,201	709	6,782	8,281	37,343	2,610	1,346	129	

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Results shown for states with at least 10 employees.

Table 4.6. Economic Impacts of the U.S. Greenhouse Manufacturing Sector by State, 2002

State	Employ-ment	Annual Wages ($1000)*	Output ($Mn)*	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*	Export Share
Texas	89	3,291	18	38	283	18	13	1	95.1%
California	46	1,790	10	21	155	10	7	1	97.8%
Illinois	29	1,174	7	15	105	7	5	0	98.6%
Nebraska	43	1,479	8	15	128	6	5	0	96.3%
Georgia	39	1,059	6	12	99	5	4	0	96.5%
North Carolina	36	1,194	7	12	100	5	4	0	96.8%
Florida	29	888	5	10	84	5	3	0	98.3%
Tennessee	25	941	5	10	79	5	3	0	98.2%
Alabama	25	892	5	9	72	4	3	0	97.5%
Indiana	23	754	4	8	65	4	3	0	99.5%
Ohio	26	737	4	7	61	3	2	0	99.6%
Arkansas	16	576	3	6	44	2	2	0	97.0%
Missouri	15	548	3	6	49	3	2	0	97.5%
Pennsylvania	15	501	3	6	46	3	2	0	99.9%
Wisconsin	15	592	3	6	48	3	2	0	98.7%
Arizona	16	449	2	5	41	2	2	0	97.3%
Iowa	17	502	3	5	42	2	1	0	98.5%
Louisiana	15	478	3	5	39	2	1	0	96.4%
Michigan	12	467	3	5	36	2	0	0	100.0%
Mississippi	16	582	3	5	42	2	2	0	97.1%
New York	11	449	2	5	31	2	2	0	99.1%
Oklahoma	10	294	2	3	27	1	1	0	97.1%
Total	659	22,642	126	244	1,927	110	78	7	

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Results shown for states with at least 10 employees.

5. Results for the Horticultural Service Sectors

Horticultural service firms include those that provide a plethora of lawn and landscape design, installation (construction), and maintenance services. This section also includes definitions for each major industry sector within the horticultural services industry. These include *Landscape Services* (561730) and *Landscape Architectural Services* (541320), which are described in more detail below (Table 5-1).

Table 5-1. Specialties for Horticultural Service Firms.

Landscape Service Firms	
Arborist Services	Plant And Shrub Maintenance In Buildings
Cemetery Plot Care Services	Plant Maintenance Services
Fertilizing Lawns	Pruning Services, Ornamental Tree And Shrub
Garden Maintenance Services	Seasonal Property Maintenance Services (I.E., Snow Plowing)
Hydroseeding Services (e.g., Decorative, Erosion Control Purposes)	Seeding Lawns
Landscape Care And Maintenance Services	Shrub Services (e.g, Bracing, Planting, Pruning, Removal, Spraying)
Landscape Contractors (Except Construction)	Snow Plowing Services Combined With Landscaping Services
Landscape Installation Services	Sod Laying Services
Landscaping Services (Except Planning)	Spraying Lawns
Lawn Care Services (e.g., Fertilizing, Mowing, Seeding, Spraying)	Tree And Brush Trimming, Overhead Utility Line
Lawn Fertilizing Services	Tree Pruning Services
Lawn Maintenance Services	Tree Removal Services
Lawn Mowing Services	Tree Services (e.g., Bracing, Planting, Pruning, Removal, Spraying)
Lawn Seeding Services	Tree Surgery Services
Lawn Spraying Services	Tree Trimming Services
Line Slash (i.e., Rights Of Way) Maintenance Services	Tropical Plant Maintenance Services
Maintenance Of Plants And Shrubs In Buildings	Turf (Except Artificial) Installation Services
Mowing Services (e.g., Highway, Lawn, Road Strip)	Weed Control And Fertilizing Services (Except Crop)
Ornamental Tree And Shrub Services	
Landscape Architectural Service Firms	
Architects' Offices, Landscape	Landscape Architectural Services
Architects' Private Practices, Landscape	Landscape Consulting Services
Architectural Services, Landscape	Landscape Design Services
City Planning Services	Landscape Planning Services
Garden Planning Services	Ski Area Design Services
Golf Course Design Services	Ski Area Planning Services
Industrial Land Use Planning Services	Town Planners' Offices
Land Use Design Services	Town Planning Services
Land Use Planning Services	Urban Planners' Offices
Landscape Architects' Offices	Urban Planning Services
Landscape Architects' Private Practices	

Landscaping Services (561730). This industry sector comprises: (1) establishments primarily engaged in providing landscape care and maintenance services and/or installing trees, shrubs, plants, lawns, or gardens and (2) establishments primarily engaged in providing these services along with the design of landscape plans and/or the construction (i.e., installation) of walkways, retaining walls, decks, fences, ponds, and similar structures. As a *c*ross-reference**,** firms in this sector do not include establishments primarily engaged in: installing artificial turf or in constructing or installing walkways, retaining walls, decks, fences, ponds, or similar structures, which are

classified in under Construction (Sector 23); planning and designing the development of land areas for projects, such as parks and other recreational areas; airports, highways, hospitals, schools, land subdivisions, and commercial, industrial, and residential areas (without also installing trees, shrubs, plants, lawns/gardens, walkways, retaining walls, decks, and similar items or structures), which are classified in, Landscape Architectural Services (541320); retailing landscaping materials and providing the installation and maintenance of these materials, which are classified under Nursery, Garden Center, and Farm Supply Stores (444220).

Landscape Architectural Services (541320). This industry sector is comprised of establishments primarily engaged in planning and designing the development of land areas for projects, such as parks and other recreational areas; airports; highways; hospitals; schools; land subdivisions; and commercial, industrial, and residential areas, by applying knowledge of land characteristics, location of buildings and structures, use of land areas, and design of landscape projects. Cross-references in the NAICS database do not include establishments primarily engaged in providing landscape care and maintenance services and/or installing trees, shrubs, plants, lawns, or gardens along with the design of landscape plans, which are classified under Landscaping Services (561730).

Sales, payroll, and employment data for the horticultural services sector are presented in Table 5-2. Within the total number of firms providing horticultural services (82,683), 93 percent are in the Landscape Services sector (76, 458 firms), with the remaining firms offering Landscape Architectural Services (6,225 firms). These sectors combined represent 32 percent of the total number of establishments included in the study. Although landscape service only represent roughly one-third of the number of establishments, they employ almost 51 percent of the total number of paid employees, with an annual payroll exceeding $11.5 billion. Again, firms in the landscape service sector dominated the employment and payroll breakdown, representing 93 percent of the paid employees and 90 percent of the annual payroll. The $38.8 Bn in sales for the landscape sector made up almost 27 percent of the total sales for all sectors included in the study ($145.4 Bn), with landscape services firms and landscape architectural firms representing 91 percent and 9 percent, respectively.

Table 5-2. Sales and Employment in the U.S. Horticultural Services Sectors, 2002

Industry Sector	Establish-ments	Paid Employees	Annual Payroll ($Mn)	Sales Receipts ($Mn)
Landscaping Services	76,458	514,962	11,509	35,235
Landscape Architectural Services	6,225	36,679	1,330	3,569
Total Horticultural Services	82,683	551,641	12,839	38,804

Sources: 2002 Economic Census (US Census Bureau)

Table 5-3 presents estimates of the economic impacts of the horticultural services sectors in the U.S. In terms of output, the landscaping services sector represents 92 percent of total horticultural services industry output, whereas landscape architecture firms represent the remaining 8 percent. Additionally, landscaping service firms accounted for 93 percent of the persons employed in the horticultural services industry at $11.5 Bn in labor income. The horticultural services industry as a whole also paid $1.3 Bn in indirect business taxes, roughly 20 percent of that paid by all sectors included in the survey. In terms of value added, the horticultural services sectors contributed $39 Bn, which was almost 41 percent of the total value added for all sectors in this study.

Table 5-3. Economic Impacts of the U.S. Horticultural Services Sectors, 2002

Industry Sector	Output Impacts ($Mn)*	Employ-ment (jobs)	Value Added ($Mn)*	Labor Income ($Mn)*	Indirect Business Taxes ($Mn)*
Landscaping Services	52,971	704,875	35,564	27,719	1,312
Landscape Architecture	4,803	48,683	3,449	2,549	74
Total Horticultural Services	57,774	753,557	39,013	30,269	1,387

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Landscape Services

Tables 5-4 and 5-5 present the economic impacts of the landscape services and landscape architectural sectors by state, respectively. The top 5 states providing landscape services include (in rank order): California, Florida, Texas, Illinois, and Ohio with impacts ranging from $8.3 Bn for California to $2.2 Bn for Ohio. These top five states represent 38 percent of the national total, with combined impacts of a little over $20 billion. The next five states in terms of importance are New Jersey, Pennsylvania, North Carolina, Virginia, and Maryland. The top 10 states combined represent 55 percent of the national economic impacts for landscape services, while the top 20 states account for 81 percent ($42.8 Bn) of the national total.

In terms of the 704,875 jobs created by the landscape services sector nationally, the top five employment states (California, Florida, Texas, Ohio, and North Carolina) account for 280,562 of them, representing 40 percent of the national work force. Illinois, Virginia, Georgia, Pennsylvania, and Arizona are the next five highest employing states, adding another 119,335 jobs and, when combined with the top five states, represent 57 percent of the national workforce. Considering these top 10 states, along with the next 10 states, then the top 20 employing states account for 80 percent of the national workforce.

Landscape Architecture

The top five states providing landscape architectural services include (in rank order): California, Texas, Illinois, Florida, and Michigan with impacts ranging from $1.1 Bn for California to $236 Mn for Michigan. These top five states represent 46 percent of the national total, with combined impacts of a little over $2.2 billion. The next five states in terms of importance are Massachusetts, Colorado, New York, Pennsylvania, and New Jersey. The top 10 states combined represent two-thirds (66 percent) of the national economic impacts for landscape services, while the top 20 states account for 86 percent ($4.1 Bn) of the national total.

In terms of the 48,683 jobs created by the landscape services sector nationally, the top five employment states (California, Texas, Florida, Michigan, and Illinois) account for 21,904 of them, representing 45 percent of the national landscape architectural work force. Massachusetts, Pennsylvania, Colorado, New York, and North Carolina are the next 5 highest employing states, adding another 8,480 jobs and, when combined with the top five states, represent 62 percent of the national workforce. Considering these top 10 states, along with the next 10 states, then the top 20 employing states account for 84 percent of the national landscape architect workforce.

Table 5-4. Economic Impacts of the U.S. Landscaping Services Sector by State, 2002

Rank	State	Establish-ments	Employ-ment	Annual Wages ($Mn)*	Output ($Mn)*	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*
	Total	**76,458**	**514,962**	**11,978**	**36,670**	**52,971**	**704,875**	**35,564**	**27,719**	**1,312**
1	California	7,271	86,446	1,790	5,480	8,269	115,134	5,644	4,523	215
2	Florida	6,308	45,096	843	2,580	3,801	59,935	2,562	2,045	98
3	Texas	3,617	36,772	726	2,223	3,179	47,435	2,086	1,675	80
4	Illinois	2,997	16,952	614	1,879	2,621	24,818	1,786	1,449	63
5	Ohio	3,431	22,854	537	1,644	2,248	30,400	1,479	1,200	48
6	New Jersey	3,568	16,163	462	1,414	1,982	21,878	1,354	1,095	49
7	Pennsylvania	3,488	18,960	490	1,501	1,909	23,589	1,300	1,067	41
8	North Carolina	2,620	17,939	337	1,033	1,803	27,658	1,173	910	53
9	Virginia	2,040	17,829	387	1,183	1,760	24,768	1,170	938	43
10	Maryland	1,598	13,940	344	1,054	1,720	21,702	1,166	929	45
11	New York	4,807	15,907	512	1,567	1,693	17,198	1,219	1,033	29
12	Georgia	2,268	18,886	392	1,199	1,664	24,250	1,127	910	41
13	Michigan	2,933	12,539	410	1,254	1,561	16,066	1,060	32	32
14	Massachusetts	2,468	9,515	350	1,070	1,558	14,659	1,062	858	39
15	Colorado	1,523	11,552	296	907	1,408	17,234	939	749	38
16	Arizona	1,373	15,461	281	860	1,393	21,970	929	733	39
17	Indiana	1,592	9,992	251	768	1,096	14,155	714	573	27
18	Washington	1,952	10,331	248	760	1,096	14,196	734	592	27
19	Connecticut	1,791	6,900	233	715	1,080	10,691	742	592	29
20	Wisconsin	1,475	6,829	213	653	957	10,765	633	508	24
21	South Carolina	1,306	8,900	163	499	933	14,770	606	420	29
22	Tennessee	1,193	8,913	194	593	910	12,865	603	477	24
23	Nevada	576	7,719	168	516	897	12,067	610	479	27
24	Minnesota	1,501	5,883	184	562	877	9,570	576	459	23
25	Missouri	1,468	8,936	202	619	676	9,667	450	380	11
26	Alabama	833	6,994	131	402	627	10,027	405	318	16
27	Oregon	1,079	6,324	143	439	602	8,436	406	329	14
28	Kansas	619	3,859	87	266	378	5,330	246	199	9
29	Kentucky	755	4,098	85	259	353	5,370	230	186	8
30	Iowa	658	3,134	76	233	306	4,158	199	162	7
31	Oklahoma	551	6,469	89	273	305	6,909	199	168	5
32	Utah	680	2,740	63	192	302	4,238	195	156	8
33	New Hampshire	555	2,110	62	190	298	3,428	195	156	8
34	Hawaii	251	2,514	52	158	274	4,038	186	147	8
35	Louisiana	662	4,035	71	217	244	4,414	158	133	4
36	Arkansas	435	2,916	54	166	240	3,980	154	123	6
37	Idaho	453	2,205	52	159	239	3,404	156	124	6
38	Maine	452	1,686	45	137	227	2,998	147	116	6
39	Rhode Island	502	1,185	42	129	226	2,404	151	117	6
40	Delaware	259	1,939	41	125	213	3,010	138	108	6
41	Nebraska	540	2,064	52	159	199	2,626	129	107	4
42	New Mexico	235	2,408	44	135	184	3,121	121	98	4
43	Mississippi	429	2,210	37	114	168	2,995	106	85	4
44	West Virginia	229	1,822	37	114	141	2,245	92	76	3
45	Vermont	282	726	24	73	111	1,264	72	58	3
46	Montana	254	641	16	48	62	872	39	32	1
47	Wyoming	164	437	15	46	62	682	40	32	1
48	Alaska	93	349	14	42	46	400	31	26	1
49	South Dakota	173	541	11	34	41	647	25	21	1
50	North Dakota	149	345	8	25	31	442	20	16	1

Note: export share values shown for TX, MN and NM were taken from 1999 *Implan* model data to correct unreasonably low values (<1%).

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Table 5-5. Economic Impacts of the U.S. Landscape Architecture Sector by State, 2002

Rank	State	Establish-ments	Employ-ment	Annual Wages ($Mn)*	Output ($Mn)*	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*
	Total	**6,225**	**36,679**	**1,384**	**3,714**	**4,803**	**48,683**	**3,449**	**2,549**	**74**
1	California	894	7,923	287	771	1,102	11,294	785	601	20
2	Texas	293	2,916	103	277	372	3,959	264	203	6
3	Illinois	377	1,575	83	224	256	1,909	186	146	3
4	Florida	422	2,532	88	236	250	2,697	185	146	2
5	Michigan	195	940	51	137	236	2,045	161	5	5
6	Massachusetts	236	1,093	56	152	230	1,890	163	124	5
7	Colorado	183	1,071	51	136	204	1,825	144	110	4
8	New York	373	1,422	69	185	194	1,507	144	114	2
9	Pennsylvania	263	1,317	50	135	183	1,844	130	100	3
10	New Jersey	233	1,004	42	112	146	1,340	105	81	2
11	North Carolina	199	1,105	36	97	122	1,414	88	68	2
12	Georgia	200	1,218	39	105	118	1,370	86	68	1
13	Arizona	133	1,082	38	102	115	1,228	84	66	1
14	Virginia	144	1,057	33	89	109	1,292	80	62	1
15	Ohio	172	855	33	88	107	1,093	77	60	1
16	Wisconsin	100	633	26	70	89	882	64	49	1
17	Maryland	133	707	26	71	87	894	64	50	1
18	Washington	171	618	24	65	85	846	61	47	1
19	Tennessee	93	729	18	48	65	929	46	35	1
20	Connecticut	96	427	20	53	62	523	46	36	1
21	Oregon	84	543	16	43	58	735	42	32	1
22	Minnesota	90	384	17	45	56	510	40	31	1
23	Hawaii	34	365	14	39	46	454	33	26	1
24	Indiana	102	382	14	36	44	477	32	25	1
25	South Carolina	90	462	14	37	44	563	32	25	1
26	Alabama	58	435	11	29	41	590	29	22	1
27	Kansas	32	373	11	28	39	507	27	21	1
28	Nevada	45	351	11	30	32	366	23	19	0
29	Missouri	78	310	10	26	27	327	20	16	0
30	Maine	44	173	7	20	26	254	18	14	0
31	Iowa	46	201	8	22	23	213	17	13	0
32	New Mexico	49	206	6	16	23	316	17	13	0
33	Mississippi	39	281	7	19	22	314	16	12	0
34	Louisiana	55	340	7	19	21	370	15	12	0
35	Kentucky	53	264	7	19	20	274	15	12	0
36	New Hampshire	29	110	5	14	18	157	13	10	0
37	Oklahoma	49	238	6	17	17	249	13	10	0
38	Delaware	25	123	4	10	16	184	11	8	0
39	Nebraska	29	147	6	15	16	157	12	9	0
40	Arkansas	30	147	6	15	15	155	11	9	0
41	Utah	67	140	5	13	14	150	10	8	0
42	Idaho	33	118	4	11	11	130	8	7	0
43	Vermont	31	52	3	7	9	81	6	5	0
44	Rhode Island	32	50	2	5	7	70	5	4	0
45	Alaska	7	50	2	5	6	68	5	4	0
46	Montana	31	50	2	5	6	60	4	3	0
47	West Virginia	14	50	2	5	6	58	4	3	0
48	Wyoming	16	50	2	5	5	53	4	3	0
49	South Dakota	15	50	2	4	4	52	3	3	0
50	North Dakota	8	8	0	1	1	10	1	1	0

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

6. Results for the Wholesale and Retail Trade Sectors

A total of seven sectors comprise the U.S. horticultural wholesale and retail trade industries: 1) wholesale flower, nursery stock & florist supply; 2) wholesale lawn & garden equipment; 3) retail lawn and garden supply stores; 4) retail building materials and supply stores; 5) florists; 6) retail food and beverage stores; and 7) retail general merchandise stores. The first two sectors are wholesale establishments that provide horticultural products and services to the retail sector, including plant material, chemical and fertilizer supplies, and various types of lawn and garden equipment. Retail lawn and garden supply stores are independent and chain stores that sell primarily horticultural goods and services to end consumers. Retail building materials and supply stores are largely home improvement centers, such as Lowes, Home Depot, and Ace Hardware, all of which have lawn and garden centers. Retail food and beverage stores focus mostly on food items, but increasingly are including a floral section and seasonal landscape plant material. Examples of these stores are Albertson's, Publix, Safeway, Winn Dixie, and Kroger. The last category, retail general merchandise stores would include large chain stores such as Wal-Mart and Target.

Table 6-1 presents summary information on the number of establishments, paid employees, annual payroll, and output gross margin for the seven industry sectors for horticultural goods. More than 116,000 establishments represent the wholesale and retail trade sectors. In terms of employment, two sectors accounted for 55 percent of all employees (510,512) hired by the industry. The largest of these was the retail lawn and garden supply stores which accounted for one third (171,149) of the total, followed by florists with nearly 113,929 (22 percent of the total). Sectors with the smallest number of paid workers were the retail food and beverage stores, and wholesale lawn and garden equipment stores. Annual payroll ranged from a high of $3.9 billion for the retail lawn and garden supply stores to a low of $343 million for retail food and beverage stores. In terms of per capita compensation (annual payroll divided by number employees), the two wholesale sectors paid nearly double the wages of the five retail sectors. Output gross margins varied from a high of $9.5 billion for retail lawn and garden supply stores to a low of $917 million for retail food and beverage stores. Output gross margin generated per employee averaged $45,000 for all seven sectors, but ranged from a low of $25,000 for florists to a high of $110,000 for wholesale lawn and garden equipment stores.

Table 6-1. Output, Employment and Payroll in the U.S. Environmental Horticulture Wholesale and Retail Trade Sectors, 2002

Industry Sector	Establish-ments	Paid Employees	Annual Payroll ($Mn)	Output-Gross Margin on Sales ($Mn)
Wholesale Flower, Nursery Stock & Florist Supply	4,816	60,010	1,645	2,094
Wholesale Lawn & Garden Equipment	4,041	29,102	984	3,187
Retail Lawn and Garden Supply Stores	21,065	171,149	3,922	9,503
Retail Building Materials and Supply Stores *	18,623	60,450	1,673	4,108
Florists	22,753	113,929	1,550	2,904
Retail Food and Beverage Stores*	22,465	19,222	343	917
Retail General Merchandise Stores Sector*	22,710	56,651	993	2,544
Total Wholesale and Retail Trade	**116,473**	**510,512**	**11,110**	**25,257**

*Estimated payroll and employment proportional to merchandise or product line sales as share of total sales.
Sources: 2002 Economic Census (US Census Bureau)

Economic impacts of the U.S. wholesale and retail trade sectors for horticultural goods are presented in Table 6-2. This industry group accounted for 37 percent of total output impacts of the U.S. Green Industry, and nearly half (47 percent) of all jobs. It also contributed over $35 billion in value added, representing 37 percent of the Green Industry total. Of the seven sectors comprising the wholesale and retail trade industry, retail lawn and garden supply stores were the most prominent, comprising 42 percent of output impacts, 47 percent of all jobs, and paying 70 percent of all indirect business taxes. The second most important group was the retail building materials and supply stores, contributing nearly one-fifth of output impacts, 14 percent of employment, and 17

percent of indirect business taxes. Together, these two groups comprised 60 percent of output impacts, just over half of all jobs, and paid 55 percent of indirect business taxes. Florists were the third largest contributing group, followed by retail general merchandise stores, wholesale lawn and garden equipment, wholesale flower, nursery stock and florist supply, and finally retail food and beverage stores.

Table 6-2. Economic Impacts of the U.S. Environmental Horticulture Wholesale and Retail Trade Sectors, 2002

Industry Sector	Output Impacts ($Mn)*	Employ-ment (jobs)	Value Added ($Mn)*	Labor Income ($Mn)*	Indirect Business Taxes ($Mn)*
Wholesale Flower, Nursery Stock & Florist Supply	2,879	68,969	1,907	1,130	440
Wholesale Lawn & Garden Equipment	4,146	40,617	2,737	1,601	657
Retail Lawn and Garden Supply Stores	22,859	347,916	14,806	9,747	1,810
Retail Building Materials and Supply Stores	9,982	123,591	6,491	4,258	789
Florists	7,195	200,451	3,977	2,725	401
Retail Food and Beverage Stores	2,263	35,117	1,385	944	156
Retail General Merchandise Stores Sector	6,150	93,443	3,973	2,639	448
Total Wholesale and Retail Trade	**55,474**	**910,104**	**35,276**	**23,044**	**4,701**

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce)

Wholesale Flower, Nursery Stock & Florist Supply

Economic impacts of the wholesale flower, nursery stock & florist supply sector by state are presented in Table 6-3. Nationally, $2.87 billion was generated in output impacts, nearly 69,000 jobs, $1.90 billion in value added, and $440 million paid in taxes. These figures represent roughly 5 percent of economic activity from the seven trade sectors comprising ornamental horticulture-related firms. The top five states for this group were California, Florida, Illinois, New Jersey, and Texas. Together these states accounted for over half of the national output impacts, as well as over half of all jobs and indirect business taxes paid. The next five states in terms of importance are Ohio, New York, Georgia, Pennsylvania, and Massachusetts, comprising roughly an additional 20 percent in each of the impacts mentioned. In other words, the top 10 producing states accounted for nearly three-quarters of total national economic impacts and jobs. Finally, the top 20 states constituted nearly 90 percent output, employment, value added, and indirect business taxes.

Wholesale Lawn & Garden Equipment Distributors

Statewide economic impacts of the wholesale lawn & garden equipment sector are presented in Table 6-4. Nationally, this sector generated over $4 billion in output impacts, employed over 40,000 people, contributed $2.7 billion in value added impacts, and paid $657 million in indirect business taxes, representing roughly 7 percent of the total for all seven sectors. The top five states for this group were California, Illinois, Texas, Ohio, and Minnesota, together comprising nearly one-third of the national total in each of the four impact categories mentioned. The next five states in terms of importance were Iowa, Georgia, Wisconsin, North Carolina, and Nebraska. This group contributed roughly one-fifth of the national totals, indicating that the top 10 states generated half of all output, employment, value added, and indirect business taxes. The top 20 states accounted for an additional 25 percent in each of the impact categories mentioned, representing approximately 75 percent of the national totals.

Retail Lawn and Garden Supply Stores

Economic impacts of the retail lawn and garden supply stores are presented in Table 6-5. For the U.S. as a whole, this sector accounted for nearly $23 billion in output impacts, 347,916 jobs, contributed $14.8 billion in value added impacts, and paid $1.8 billion in indirect business taxes. These figures represent roughly 40 percent of total economic impacts for the wholesale/retail trade group, making it the largest of the seven horticultural industry sectors. At the state level, the top five states for this sector were California, Texas, Illinois, New York, and Pennsylvania. These five states contributed 31 percent of total output impacts, over one-fourth of all jobs, and nearly one-third of value added impacts and taxes. The next five states in terms of economic importance were Ohio, Michigan, Wisconsin, Florida, and Minnesota. These states contributed an additional 15 percent in each impact category, suggesting the top 10 states produced just under half of national totals. The next top 10 states added an additional 25 percent to each impact category, indicating that the top 20 states contributed roughly three-quarters of national economic impacts.

Retail Building Materials and Supply Stores

Table 6-6 presents state-level economic impact results for retail building materials and supply stores. This sector includes home improvement stores such as Lowe's and Home Depot that, in addition to building supplies, have fairly sizable nursery and garden supply centers. Nationally, this sector generated just under $10 billion in output impacts and $6.5 billion in value added, supported 123,591 jobs, and paid $789 million in indirect business taxes. As a share of total economic activity from the seven sectors, this group contributed approximately 18 percent. The top five states were California, Texas, Florida, New York, and Illinois. These top tier states contributed over one third of total U.S. economic impacts and taxes for the building materials and supply sector. The second tier of five states included Pennsylvania, Georgia, Michigan, Ohio and New Jersey. These states contributed an additional 18 percent share of economic impacts, indicating that the top 10 states comprised roughly half of the total for each measure. The next 10 states represented another 25 percent of the national total, making the top 20 states responsible for just over three-quarters of national output for the building materials and supply sector.

Florists

Information on the economic impacts of the U.S. florist industry is shown in Table 6-7. Nationally, this sector accounted for $7.2 billion in output impacts, supported 200,451 jobs, and paid over $400 million in indirect business taxes. As a share of total activity from the seven horticultural sectors, output impacts from florists represented 13 percent while the share of jobs was 22 percent, making it the second largest sector. In terms of state level impacts, the top five states were California, New York, Texas, Florida, and Illinois, accounting for just over one-third of total national impacts. The second tier of top five states was Pennsylvania, Ohio, Michigan, Massachusetts, and New Jersey. This group comprised around 20 percent of the total so that, when combined with the first top five, the top 10 states accounted for over half of all output. The next 10 states represented 25 percent of national output for the florist industry, making the top 20 comprising between 75 and 80 percent of the total.

Retail Food and Beverage Stores

State level economic impacts of the U.S. retail food and beverage industry are presented in Table 6-8. For the country as a whole, this group accounted for under 5 percent of economic impacts, making it the smallest of the seven sectors. This rather small share is due to the fact that most food retailers concentrate on cut flower arrangements rather than a full selection of ornamental plant products and services. In addition, although this is an increasing trend for grocery chain stores to incorporate flower shops, many still do not provide this service. Nationally, this sector contributed nearly $2.3 billion in output impacts, $1.4 billion in value added impacts, supported over 35,000 employee positions, and paid $156 million in indirect business taxes. The top five producing states were California, Texas, Florida, New York, and Pennsylvania, which together accounted for approximately 40 percent of total U.S. impacts. The second most important five states were New Jersey, Illinois,

Ohio, Massachusetts, and Georgia, comprising an additional 15 to 20 percent. Hence, the top 10 states accounted for between 55 and 60 percent of U.S. economic impacts for this sector. The next most important top 10 states represented an additional 20 to 25 percent share, making the top 20 states responsible for over three-quarters of nation-wide impacts.

Retail General Merchandise Stores

Table 6-9 presents information on state level economic impacts for the retail general merchandise stores. These would include big box stores like Wal-Mart and Target that also have garden center departments. These stores accounted for approximately 10 percent of total economic impacts of horticultural goods and services nationwide. Nationally, output impacts were estimated at $6.1 billion, value added impacts at nearly $4 billion, the number of people employed estimated at over 93,000, with $448 million paid in indirect business taxes. At the state level, the top five states were California, Texas, Florida, Illinois, and New York, representing between 25 and 30 percent of U.S. impacts, depending on the specific indicator. For instance, these top five states accounted for one quarter of output impacts, but one-third of all jobs for the sector. The second tier of top five states were Michigan, Pennsylvania, Ohio, Georgia, and Missouri, comprising an additional 18 percent. Therefore, the top 10 states were responsible for between 45-50 percent of all economic impacts in the U.S. The next top 10 states accounted for another 20 to 25 percent, making the top 20 states accountable for between 65 and 70 percent of the total.

Table 6-3. Economic Impacts of the U.S. Wholesale Flower, Nursery Stock & Florist Supply Sector by State, 2002

State	Establish-ments	Employ-ment (jobs)	Annual Wages ($Mn)*	Output Gross Margin on Sales ($Mn)*	Output Impacts ($Mn)*	Employ ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*	Export Share
Total	**4,816**	**60,010**	**1,645**	**2,094**	**2,879**	**68,969**	**1,907**	**1,130**	**440**	
California	763	10,985	319	406	485	11,793	324	191	82	11.2%
Florida	679	8,080	235	299	446	9,868	294	178	65	30.5%
Illinois	196	3,580	120	153	224	4,327	147	89	33	27.5%
New Jersey	172	2,813	95	121	198	3,590	133	82	27	48.1%
Texas	328	3,885	93	119	169	4,445	111	67	26	26.7%
Ohio	145	2,409	61	77	159	3,416	101	63	18	90.8%
New York	297	2,697	92	117	156	3,093	105	63	25	26.3%
Georgia	164	1,752	51	65	101	2,169	67	41	14	35.1%
Pennsylvania	156	2,059	52	66	76	2,167	50	29	13	9.7%
Massachusetts	97	1,243	40	51	73	1,474	49	30	11	30.3%
Michigan	132	1,369	37	47	65	1,576	43	10	10	28.8%
Washington	138	1,471	41	52	61	1,577	41	24	10	14.5%
Arizona	79	1,284	28	36	56	1,534	37	22	8	38.7%
Maryland	70	1,056	27	34	54	1,293	37	23	7	36.7%
Colorado	64	954	24	30	42	1,095	28	17	6	24.2%
North Carolina	145	1,124	27	35	41	1,199	27	16	7	12.7%
Minnesota	73	923	23	30	40	1,039	26	16	6	20.9%
Missouri	61	1,192	22	28	33	1,244	22	13	6	9.7%
South Carolina	64	842	20	25	32	936	21	12	5	23.7%
Connecticut	55	574	16	21	29	655	19	12	4	28.9%
Virginia	67	755	16	20	29	863	20	12	4	30.3%
Oregon	77	652	18	23	28	719	19	11	5	17.6%
Alabama	64	741	16	21	26	809	17	10	4	20.8%
Tennessee	88	753	18	23	26	791	17	10	5	9.7%
Indiana	73	756	18	22	25	793	17	10	4	10.3%
Wisconsin	69	656	18	23	25	691	17	10	4	9.7%
Oklahoma	34	644	13	17	19	674	12	7	3	9.7%
Kansas	23	472	11	15	16	496	11	6	3	9.7%
Kentucky	51	519	12	15	16	538	11	6	3	9.7%
Mississippi	39	577	11	14	15	598	10	6	3	9.7%
Louisiana	44	493	9	11	14	539	9	6	2	23.9%
Hawaii	34	321	7	9	10	343	7	4	2	13.4%
Nevada	25	151	4	6	9	186	6	4	1	45.0%
Rhode Island	7	177	5	6	9	214	6	4	1	46.8%
Utah	31	269	6	8	9	286	6	4	2	9.7%
New Hampshire	18	123	4	5	8	160	5	3	1	49.8%
South Dakota	11	228	6	8	8	240	6	3	1	9.7%
Arkansas	28	248	5	6	7	257	4	3	1	9.7%
Iowa	27	242	5	6	7	252	5	3	1	9.7%
Delaware	10	154	3	4	6	179	4	2	1	53.6%
Nebraska	15	155	3	4	4	162	3	2	1	9.7%
West Virginia	15	141	3	4	4	146	3	1	1	11.1%
Idaho	15	93	2	2	3	99	2	1	0	14.8%
Montana	8	73	2	2	3	86	2	1	0	33.4%
New Mexico	17	95	2	3	3	100	2	1	1	9.7%
Vermont	12	51	1	2	3	62	2	1	0	38.5%
Alaska	6	51	1	2	2	53	1	1	0	9.7%
Maine	13	51	1	2	2	58	2	1	0	25.4%
Wyoming	5	51	1	2	2	55	1	1	0	16.0%
North Dakota	7	28	0	1	1	32	1	0	0	45.5%

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Table 6-4. Economic Impacts of the U.S. Wholesale Lawn & Garden Equipment Sector by State, 2002

State	Establish-ments	Employ-ment	Annual Wages ($Mn) *	Output Gross Margin on Sales ($Mn) *	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*	Export Share
Total	**4,041**	**29,102**	**984**	**3,187**	**4,146**	**40,617**	**2,737**	**1,601**	**657**	
California	288	2,040	77	249	297	2,536	199	117	50	11.2%
Illinois	184	1,649	60	194	284	2,597	187	113	42	27.5%
Texas	294	1,857	60	194	276	2,768	181	109	42	26.7%
Ohio	144	1,166	38	124	255	2,787	163	102	29	90.8%
Minnesota	184	1,395	51	164	220	2,036	145	86	34	20.9%
Iowa	229	1,593	51	165	183	1,844	121	70	33	9.7%
Georgia	115	918	31	100	156	1,560	103	63	22	35.1%
Wisconsin	173	1,264	42	138	154	1,482	102	60	27	9.7%
North Carolina	106	862	40	130	152	1,141	101	59	26	12.7%
Nebraska	142	1,104	35	113	127	1,305	84	49	22	9.7%
Florida	146	717	25	80	119	1,195	79	48	17	30.5%
Kansas	122	974	33	106	119	1,150	79	46	21	9.7%
Michigan	100	817	26	85	117	1,187	77	18	18	28.8%
Missouri	128	961	29	94	107	1,133	71	41	19	9.7%
Indiana	117	864	29	94	106	1,018	70	41	19	10.3%
New York	112	667	23	75	100	920	67	40	16	26.3%
Pennsylvania	120	807	26	85	97	944	65	38	17	9.7%
North Dakota	83	618	20	66	95	1,059	61	37	14	45.5%
Washington	70	594	20	66	78	730	52	30	13	14.5%
Tennessee	84	636	21	68	77	748	51	29	13	9.7%
Colorado	66	494	17	54	76	746	50	30	11	24.2%
Arkansas	88	653	21	68	75	753	49	29	13	9.7%
Virginia	70	496	16	50	73	762	48	30	11	30.3%
Oregon	59	408	14	47	58	546	38	23	10	17.6%
New Jersey	39	233	10	33	54	444	36	22	7	48.1%
Idaho	59	423	14	44	52	539	34	20	9	14.8%
Arizona	38	236	10	31	49	454	32	20	7	38.7%
Louisiana	50	443	12	38	49	602	32	19	8	23.9%
South Dakota	60	426	13	44	48	497	32	18	9	9.7%
Alabama	72	405	12	38	47	529	31	18	8	20.8%
Maryland	30	254	9	29	47	457	31	20	6	36.7%
Oklahoma	67	434	13	41	46	510	31	18	8	9.7%
Kentucky	76	440	13	41	45	494	30	17	8	9.7%
Mississippi	57	381	12	39	43	439	28	16	8	9.7%
Connecticut	11	169	8	24	34	264	23	14	5	28.9%
Montana	39	248	7	24	32	375	21	12	5	33.4%
Massachusetts	22	142	7	22	31	240	21	13	5	30.3%
South Carolina	44	246	7	23	29	330	19	11	5	23.7%
Utah	29	294	7	24	28	347	18	11	5	9.7%
Nevada	12	114	4	12	19	190	13	8	3	45.0%
Delaware	9	100	3	10	16	170	10	6	2	53.6%
Wyoming	13	114	4	12	14	143	9	5	3	16.0%
New Hampshire	11	66	2	8	13	128	8	5	2	49.8%
New Mexico	21	123	3	11	12	143	8	5	2	9.7%
Maine	16	83	2	8	10	117	7	4	2	25.4%
Vermont	14	68	2	7	10	115	7	4	1	38.5%
Hawaii	7	35	2	6	7	49	5	3	1	13.4%
West Virginia	14	53	2	6	6	61	4	2	1	11.1%
Rhode Island	4	18	1	2	3	30	2	1	0	46.8%
Alaska	1	3	0	0	0	3	0	0	0	9.7%

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Table 6-5. Economic Impacts of the U.S. Retail Lawn and Garden Supply Stores Sector by State, 2002

State	Establish-ments	Employ-ment	Annual Wages ($Mn)*	Output Gross Margin on Sales ($Mn)*	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*
Total	**21,065**	**171,149**	**3,922**	**9,503**	**22,859**	**347,916**	**14,806**	**9,747**	**1,810**
California	1,459	14,272	383	928	2,517	31,352	1,657	1,131	191
Texas	1,487	12,269	244	590	1,505	25,386	962	644	120
Illinois	842	7,516	197	478	1,288	15,641	826	560	97
New York	852	6,410	168	407	927	11,640	621	420	77
Pennsylvania	914	6,636	137	331	830	13,186	531	357	65
Ohio	884	6,972	153	370	821	13,103	524	353	64
Michigan	688	5,339	133	323	756	10,617	485	60	60
Wisconsin	603	5,798	136	329	751	11,567	478	324	60
Florida	907	5,720	119	288	748	12,661	488	328	58
Minnesota	611	4,705	115	279	728	10,018	464	314	56
Georgia	619	5,042	110	268	690	11,400	453	305	55
Missouri	658	5,621	111	269	674	12,056	430	289	53
Indiana	659	5,324	119	288	654	10,323	412	276	53
Virginia	540	5,400	108	261	647	11,014	427	292	50
Washington	544	4,585	111	269	606	8,956	397	269	49
North Carolina	736	5,157	105	256	592	10,365	382	258	48
Iowa	588	4,227	111	268	569	8,092	362	243	47
Tennessee	473	4,584	91	220	524	9,437	335	223	42
Colorado	298	3,068	79	193	521	6,990	340	232	40
New Jersey	459	3,018	79	191	443	5,907	297	202	36
Maryland	273	2,987	67	163	427	6,641	288	200	32
Massachusetts	327	2,392	70	170	417	5,038	279	191	33
Oregon	342	3,115	72	174	407	6,381	265	178	33
Nebraska	335	2,815	70	170	391	5,576	248	168	31
Kentucky	457	3,742	78	189	385	6,725	245	165	33
Kansas	312	2,958	64	156	357	5,791	225	151	29
Idaho	201	2,093	64	155	337	4,559	220	149	28
Connecticut	270	2,251	59	142	329	4,479	223	152	27
Arizona	236	2,344	53	128	311	4,945	204	138	24
Louisiana	350	2,656	50	122	271	5,256	174	118	22
Oklahoma	325	2,443	44	107	252	4,951	159	107	20
Mississippi	298	2,151	50	122	249	3,928	158	107	21
Arkansas	319	2,137	46	112	232	3,844	146	98	19
South Carolina	371	2,200	43	103	220	4,249	143	93	18
Alabama	362	1,986	36	88	189	3,786	122	82	16
South Dakota	186	1,435	35	86	181	2,693	114	78	15
Utah	140	1,356	27	67	174	3,175	111	76	13
Montana	128	1,279	25	61	122	2,372	78	53	10
New Hampshire	128	859	22	52	121	1,844	79	54	10
Nevada	72	885	20	49	109	1,745	73	49	9
North Dakota	126	932	23	56	109	1,652	69	47	9
Maine	131	766	16	38	81	1,508	53	36	7
New Mexico	100	867	15	36	80	1,772	53	36	6
Vermont	86	589	14	35	75	1,196	49	34	6
West Virginia	130	792	14	33	62	1,328	39	27	5
Delaware	64	478	12	29	60	876	39	26	5
Hawaii	43	312	7	17	41	685	28	20	3
Wyoming	66	358	8	20	39	639	25	17	3
Alaska	24	167	4	9	19	307	13	9	2
Rhode Island	43	143	4	9	18	265	12	8	2

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Table 6-6. Economic Impacts of the U.S. Retail Building Materials and Supply Stores Sector by State, 2002

State	Establishments	Employment (jobs)	Annual Wages ($Mn)*	Output Gross Margin on Sales ($Mn)*	Output Impacts ($Mn)*	Employment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*
Total	**18,623**	**60,450**	**1,673**	**4,108**	**9,982**	**123,591**	**6,491**	**4,258**	**789**
California	1,554	6,292	182	446	1,210	13,822	797	544	92
Texas	1,118	4,178	112	275	703	8,645	449	301	56
Florida	1,107	3,694	97	237	617	8,175	402	270	48
New York	1,116	3,244	95	232	528	5,890	354	239	44
Illinois	730	2,584	72	178	479	5,378	308	208	36
Pennsylvania	803	2,446	66	162	407	4,859	260	175	32
Georgia	552	2,073	61	149	384	4,687	252	170	30
Michigan	745	2,351	66	162	380	4,675	244	30	30
Ohio	784	2,472	65	160	355	4,645	226	153	28
New Jersey	494	1,768	57	141	326	3,461	218	149	27
North Carolina	613	1,999	55	134	311	4,018	201	136	25
Massachusetts	412	1,414	48	118	291	2,978	194	133	23
Colorado	339	1,184	37	91	247	2,697	161	110	19
Virginia	414	1,486	40	99	244	3,030	161	110	19
Minnesota	442	1,310	37	92	239	2,789	152	103	18
Maryland	283	1,173	34	85	222	2,607	150	104	17
Missouri	465	1,366	35	86	216	2,929	138	93	17
Wisconsin	431	1,401	38	94	214	2,795	136	92	17
Indiana	463	1,503	38	93	211	2,914	133	89	17
Tennessee	410	1,225	34	83	198	2,521	127	84	16
Washington	388	1,215	35	87	196	2,374	128	87	16
Arizona	282	1,208	32	80	194	2,548	127	86	15
Connecticut	235	847	28	68	159	1,685	107	73	13
South Carolina	302	916	23	56	120	1,769	78	51	10
Alabama	322	919	22	54	117	1,753	75	51	10
Oregon	256	678	20	49	114	1,388	74	50	9
Louisiana	290	874	20	50	110	1,730	71	48	9
Kentucky	300	820	20	50	102	1,474	65	44	9
Iowa	303	726	18	44	94	1,391	60	40	8
Utah	159	524	15	36	94	1,227	60	41	7
Oklahoma	234	615	15	36	86	1,245	54	36	7
Kansas	239	592	15	37	85	1,159	53	36	7
New Hampshire	126	397	12	30	70	852	45	31	6
Nevada	103	406	12	30	66	801	44	30	5
Arkansas	209	517	13	31	64	929	40	27	5
Nebraska	183	440	11	27	61	871	39	26	5
Mississippi	205	521	12	29	60	951	38	26	5
New Mexico	128	361	10	23	53	739	34	24	4
Idaho	137	339	9	21	46	739	30	20	4
Maine	130	316	8	21	44	621	29	20	4
West Virginia	135	347	8	20	37	582	24	16	3
Delaware	62	234	6	15	31	430	20	14	3
Hawaii	60	200	5	13	30	440	21	14	2
Alaska	51	208	6	14	29	381	19	13	2
Montana	130	251	6	14	29	465	18	12	2
Rhode Island	58	179	6	14	28	331	19	13	2
Vermont	78	164	5	12	26	334	17	11	2
South Dakota	101	202	5	11	24	379	15	10	2
North Dakota	84	177	4	11	21	314	14	9	2
Wyoming	61	97	3	7	13	173	8	6	1

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Table 6-7. Economic Impacts of the U.S. Florists Sector by State, 2002

State	Establish-ments	Employ-ment	Annual Wages ($Mn)*	Output Gross Margin on Sales ($Mn)*	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*
Total	**22,753**	**113,929**	**1,550**	**2,904**	**7,195**	**200,451**	**3,977**	**2,725**	**401**
California	1,940	9,962	139	260	725	19,131	424	302	41
New York	1,515	6,401	114	214	509	10,688	298	213	31
Texas	1,522	6,909	93	175	454	12,248	247	172	26
Florida	1,167	6,115	88	165	439	11,951	251	176	25
Illinois	991	5,784	82	154	427	10,571	238	168	23
Pennsylvania	1,103	5,667	75	140	364	9,845	195	137	20
Ohio	951	5,203	69	129	294	8,979	159	113	16
Michigan	801	4,868	64	119	286	8,354	155	16	16
Massachusetts	601	2,970	56	104	263	5,364	155	112	15
New Jersey	778	3,595	57	107	259	6,095	150	108	15
Virginia	602	3,381	50	94	236	5,914	130	93	12
Minnesota	467	3,225	41	77	207	5,870	112	79	11
Georgia	663	2,909	40	75	198	5,495	113	80	11
Maryland	365	2,588	40	74	196	4,905	115	83	11
Missouri	515	2,541	35	65	169	4,558	89	62	9
Indiana	572	3,336	39	72	166	5,477	84	59	9
North Carolina	682	2,816	37	69	160	4,947	87	62	9
Tennessee	526	2,244	30	57	137	3,910	73	51	8
Wisconsin	465	2,777	30	56	129	4,634	66	47	7
Colorado	357	1,778	24	45	126	3,283	70	49	7
Connecticut	277	1,578	25	47	114	2,604	66	47	7
Washington	419	2,011	26	49	113	3,320	61	43	6
Arizona	251	1,559	19	36	89	2,923	51	36	5
Kentucky	386	1,798	23	42	87	2,832	44	31	5
Louisiana	343	1,544	19	35	79	2,700	42	30	4
Alabama	404	1,608	19	35	75	2,610	38	27	4
Oklahoma	350	1,536	17	31	74	2,670	38	26	4
Oregon	245	1,273	14	27	66	2,249	36	25	4
South Carolina	350	1,354	16	30	63	2,244	33	22	4
Iowa	307	1,604	15	29	60	2,582	30	21	3
Arkansas	314	1,282	15	28	59	2,014	28	20	3
Kansas	273	1,246	13	24	57	2,085	29	20	3
New Hampshire	140	788	11	21	50	1,353	27	19	3
Mississippi	290	1,126	13	24	48	1,826	24	17	3
Hawaii	107	623	9	17	41	1,153	24	17	2
Nebraska	181	820	9	17	39	1,426	20	15	2
Utah	143	681	8	15	39	1,347	21	15	2
Nevada	118	565	8	16	35	932	20	14	2
West Virginia	212	898	10	19	35	1,316	17	12	2
Maine	150	615	8	14	30	995	15	11	2
Delaware	69	465	7	14	28	716	15	11	2
New Mexico	124	569	6	12	26	1,039	14	10	1
Rhode Island	113	502	7	13	26	752	14	10	1
Montana	108	546	6	11	22	861	11	8	1
Idaho	116	560	5	9	21	950	10	7	1
Vermont	76	360	5	9	20	609	10	7	1
Wyoming	64	360	5	9	18	552	9	6	1
South Dakota	101	398	4	7	15	647	7	5	1
North Dakota	84	351	4	7	13	552	6	5	1
Alaska	53	241	3	6	12	376	6	5	1

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Table 6-8. Economic Impacts of the U.S. Retail Food and Beverage Stores Sector by State, 2002

State	Establish-ments	Employ-ment (jobs)	Annual Wages ($Mn)*	Output Gross Margin on Sales ($Mn)*	Output Impacts ($Mn)*	Employm ent Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*
Total	**22,465**	**19,222**	**343**	**917**	**2,263**	**35,117**	**1,385**	**944**	**156**
California	2,428	1,972	48	129	355	4,195	226	159	25
Texas	1,408	1,282	23	61	157	2,374	94	65	11
Florida	1,268	1,333	22	58	153	2,477	92	64	10
New York	2,297	1,304	23	61	142	2,113	89	62	10
Pennsylvania	1,024	980	15	41	105	1,776	63	43	7
New Jersey	1,027	721	15	39	93	1,247	58	41	7
Illinois	921	645	11	30	82	1,217	50	35	5
Ohio	881	815	13	35	78	1,389	46	32	5
Massachusetts	671	597	11	30	74	1,046	46	33	5
Georgia	608	623	10	26	67	1,156	41	28	5
Michigan	878	610	10	27	63	1,062	38	4	4
Arizona	260	389	9	24	60	785	38	26	4
Maryland	502	402	9	23	60	817	39	27	4
Virginia	514	481	8	23	57	879	35	25	4
North Carolina	581	534	8	23	52	921	31	22	4
Washington	423	390	9	23	52	720	33	23	4
Colorado	337	296	7	19	51	636	32	23	4
Minnesota	384	377	6	16	43	742	26	18	3
Missouri	348	331	6	15	37	619	22	15	2
Connecticut	316	285	6	15	35	497	23	16	3
Wisconsin	343	386	6	15	35	654	20	14	2
Indiana	396	363	5	14	33	627	19	13	2
Tennessee	402	349	5	14	33	636	20	13	2
Oregon	294	243	5	12	29	460	18	13	2
Alabama	310	267	4	11	24	457	14	10	2
Louisiana	361	282	4	11	24	497	14	10	2
South Carolina	297	280	4	11	23	479	14	9	2
Kentucky	305	270	4	10	21	430	12	8	1
Iowa	177	245	4	9	20	407	12	8	1
Nevada	115	129	3	8	18	236	11	8	1
Utah	97	152	2	7	18	310	10	7	1
Kansas	210	186	3	7	17	327	10	7	1
Oklahoma	248	171	2	7	15	318	9	6	1
New Hampshire	113	134	2	6	13	231	8	6	1
Arkansas	205	142	2	5	11	233	6	4	1
Maine	145	125	2	5	11	218	7	5	1
Mississippi	228	153	2	6	11	252	7	5	1
Nebraska	140	134	2	5	11	236	7	5	1
Hawaii	105	81	2	4	10	155	7	5	1
New Mexico	95	91	2	5	10	173	6	4	1
Idaho	83	80	1	4	8	154	5	4	1
Rhode Island	107	77	1	4	7	121	5	3	1
West Virginia	132	119	1	4	7	183	4	3	1
Delaware	87	62	1	3	6	99	4	3	0
Montana	77	61	1	3	6	105	3	2	0
Vermont	80	69	1	3	6	125	4	3	0
Alaska	56	47	1	3	5	80	3	2	0
South Dakota	77	69	1	3	5	112	3	2	0
North Dakota	60	49	1	2	3	76	2	1	0
Wyoming	44	37	1	2	3	60	2	1	0

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

Table 6-9. Economic Impacts of the U.S. Retail General Merchandise Stores Sector by State, 2002

State	Establish-ments	Employ-ment (jobs)	Annual Wages ($Mn)*	Output Gross Margin on Sales ($Mn)*	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*
Total	**22,710**	**56,651**	**993**	**2,544**	**6,150**	**93,443**	**3,973**	**2,639**	**448**
California	1,406	4,851	96	245	665	8,484	437	303	47
Texas	1,857	4,425	79	203	517	7,675	332	226	38
Florida	1,237	3,326	60	154	399	5,870	259	177	29
Illinois	872	2,411	40	103	278	3,986	177	122	19
New York	1,290	2,457	45	116	265	3,721	177	122	20
Michigan	841	2,503	43	110	258	3,893	164	19	19
Pennsylvania	1,043	2,349	38	96	242	3,816	154	105	17
Ohio	1,024	2,536	42	107	237	3,953	150	103	17
Georgia	880	1,783	31	79	204	3,045	133	91	15
Missouri	558	1,529	29	74	186	2,618	118	81	13
Virginia	678	1,573	27	70	174	2,612	115	80	12
North Carolina	921	1,723	28	71	165	2,818	106	73	12
Indiana	576	1,635	26	67	152	2,524	95	64	11
Tennessee	661	1,399	23	60	142	2,373	91	62	11
Washington	302	1,145	24	62	140	1,885	92	63	11
Minnesota	331	1,150	20	51	134	1,972	85	59	10
New Jersey	543	1,213	22	56	131	1,925	87	61	10
Colorado	235	888	17	43	117	1,571	76	52	8
Arizona	305	997	18	47	114	1,700	74	51	8
Wisconsin	391	1,209	19	49	112	1,883	70	48	8
Maryland	366	1,014	16	41	107	1,744	72	50	7
Massachusetts	313	884	16	42	102	1,453	68	47	7
Louisiana	486	1,088	18	45	100	1,746	64	44	7
Oregon	226	830	17	43	100	1,435	66	45	8
Alabama	604	1,063	18	46	98	1,722	63	43	7
Kentucky	490	1,042	17	44	90	1,571	57	39	7
Oklahoma	412	890	14	37	88	1,579	56	38	6
South Carolina	477	857	14	37	78	1,329	50	33	6
Arkansas	385	763	12	32	66	1,167	41	28	5
Mississippi	451	748	12	32	65	1,145	41	28	5
Kansas	276	661	11	27	63	1,076	40	27	5
Iowa	309	689	11	29	62	1,059	39	27	5
Utah	135	484	9	22	57	885	37	25	4
Connecticut	186	527	9	23	54	822	36	25	4
Nevada	103	422	8	22	48	679	32	22	4
New Mexico	141	402	7	18	41	676	27	19	3
Nebraska	180	402	6	16	37	639	23	16	3
New Hampshire	137	327	6	15	35	532	22	16	3
West Virginia	247	431	7	17	32	620	20	14	3
Hawaii	63	249	5	13	31	456	21	15	2
Idaho	111	297	5	13	29	502	19	13	2
Maine	148	246	4	11	23	391	15	10	2
Alaska	70	186	4	10	21	297	14	10	2
Delaware	79	217	4	10	19	320	13	9	1
Montana	76	192	4	9	18	301	12	8	1
South Dakota	75	165	3	7	14	255	9	6	1
Rhode Island	59	140	2	6	12	209	8	6	1
North Dakota	50	153	2	6	11	225	7	5	1
Wyoming	41	112	2	5	9	166	6	4	1
Vermont	64	73	1	3	6	119	4	3	0

* Values expressed in 2004 dollars (GDP Implicit Price Deflator, US Dept. Commerce).

7. Economic Impacts of Urban Forestry

In the aforementioned S290 national nursery industry survey, seventeen plant categories were used to determine the distribution of nursery sales by growers in 2003. Four of these pertained to trees including deciduous shade trees, evergreen trees, Christmas trees, and fruit trees. Of the total product mix portfolio of nurseries in the U.S., these four categories represented 26.8 percent of total nursery sales. The top deciduous shade tree producing states, in terms of the share of their respective states nursery sales, included Kentucky (44% of total nursery sales), New Mexico (43%), Colorado (37%), Tennessee (32%), South Dakota (32%), Indiana (31%), Iowa (31%), and Minnesota (31%). he top evergreen tree producing states, in terms of the share of their respective states nursery sales, included North Dakota (30% of total nursery sales), Indiana (28%), Ohio (27%), Minnesota (22%), Arkansas (21%), and Montana (21%). The states with the highest relative percentage of Christmas trees and fruit trees included West Virginia (44%) and Tennessee (18%), respectively.

In 1997, the American Nursery & Landscape Association (ANLA) and the U.S.D.A. Forest Service teamed up to conduct a landmark study of landscape tree planting in the U.S. The objectives of the ongoing survey were to measure the progress of Community Forestry activities, to provide a database for planning; to confirm the availability of adequate tree supplies; and to help plan and track future care and maintenance efforts. The research study included a survey of the largest private nurseries in the U.S. as identified by the American Nursery & Landscape Association. Utilizing a representative sample of 1,872 nurseries and obtaining a response of 40 percent (749 respondents) provided results that have a margin of error plus or minus four percent. The survey determined that 122,268,000 landscape trees were shipped during 1995-96. That was a 5.1 percent increase over 1994-95 and the fourth year-in-a row that total tree shipments had increased. Tree shipments totaled 116 Mn in 1994-95; 111 Mn 1993-94; 104 Mn in 1992-93, 98 Mn in 1991-92, and 104 Mn in 1990-91. From 1991 to 1996 total tree shipments increased at an average annual rate of 3.3 percent. Of all trees shipped in 1995-96, 43.5 percent (53,144,000) were evergreens, 27.9 percent (34,132,000) were shade trees, 20.9 percent (25,519,000) were flowering trees, and 7.7 percent (9,472,000) were fruit/nut trees. From 1995 to 1996 shipments of evergreen trees increased by 8.3 percent, or 4,085,000 trees; shade trees by 3.2 percent, or 1,066,000 trees; flowering trees by 4.3 percent, or 1,056,000 trees; and fruit/nut trees decreased by 2.3 percent, or 222,000 trees. From 1991 to 1996 shipments of evergreen trees increased at an average annual rate of 6.4 percent; shade trees increased at an average annual rate of 1.3 percent; flowering trees increased at an average annual rate of 0.4 percent; and fruit/nut trees increased at an average annual rate of 3.6 percent.

Regionally, the West produced 32.2 percent of all trees in 1995-96, the South 30.8 percent, the Midwest 28.2 percent, and the East 8.8 percent. States that shipped the most trees in 1995-96 included Oregon (14.9% of total tree shipments), Michigan (13.9%), California (13.3%), Tennessee (7.9%) and Florida (7.1%). These five states accounted for 57.1 percent of all trees shipped in 1995-96. Of all trees shipped in 1995-96, landscape contractors purchased 31.9 percent, retail garden centers 27.1 percent, re-wholesalers 20.4 percent, general merchandisers 14 percent, municipalities 4.5 percent, and other customers 2.1 percent. Total landscape tree production was projected to increase 42.7 percent, with production projected to grow by an estimated 16.6 percent from 1996 to 1997, and 22.4 percent from 1997 to 1998. No other tree planting surveys have been cited in the literature since this landmark study conducted by ANLA. However, assuming that the previously mentioned benchmarks hold [that approximately 26.8 percent of nursery sales are trees that could be used in urban forestry settings and that 4.5 percent of the trees produced by nurseries are sold to municipalities] then several inferences can be drawn when coupled with the Green Industry primary and secondary data included herein.

Economic Impacts of Tree Sales and Tree Care Services

Economic impacts of the portion of urban forestry related to commercial tree production and tree care services are summarized in Table 7-1. The estimates are based on tree production by the nursery and greenhouse sector, and tree care by the landscaping services sector. The total value of tree production suitable for urban forestry, including deciduous, evergreen, fruit, and Christmas trees, was $4.63 Bn. This value represented 27.2 percent of total output by the nursery and greenhouse sector for the U.S. as a whole, but for individual states ranged from as high as 82 percent (Mississippi) to less than one percent (Hawaii). The value of tree care services was $9.92 Bn, which represented 27.1 percent of the output of the landscaping services sector. The total output of tree

production and care services was valued at $14.55 Bn. This translated into $21.02 Bn in total output impacts, 259,224 jobs, $14.12 Bn in value added, $9.93 Bn in labor income, and $516 Mn in indirect business tax impacts.

Table 7-1. Economic Impacts of U.S. Urban Forestry Tree Sales and Tree Care Services, 2002

State	Nursery & Greenhouse Sector Tree Sales ($Mn)*	Urban Forestry Tree Sales (%)	Landscaping Services Tree Care Output ($Mn)*	Total Tree Sales and Services Output ($Mn)*	Output Impacts ($Mn)*	Employ-ment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*
Alabama	71.2	27.2	109	180	281	3,905	203	125	8
Alaska	3.6	27.2	11	15	17	147	11	9	0
Arizona	80.5	27.2	233	313	539	7,243	370	268	16
Arkansas	20.7	42.4	45	66	96	1,387	66	45	2
California	642.6	18.8	1,482	2,125	3,077	37,769	2,105	1,549	75
Colorado	149.9	55.1	245	395	540	5,504	351	259	12
Connecticut	14.9	5.8	193	208	319	3,172	222	172	9
Delaware	21.3	61.5	34	55	90	1,045	65	41	2
Florida	335.3	17.5	698	1,033	1,553	21,946	1,122	768	42
Georgia	44.6	13.6	324	369	527	7,198	368	274	13
Hawaii	0.3	0.3	43	43	75	1,101	51	40	2
Idaho	19.4	28.1	43	62	95	1,179	68	49	2
Illinois	117.4	31.5	508	626	845	7,519	568	436	19
Indiana	121.8	62.4	208	330	469	5,197	290	209	11
Iowa	33.9	42.0	63	97	127	1,396	76	56	3
Kansas	16.3	27.2	72	88	133	1,673	82	63	3
Kentucky	53.1	53.1	70	123	166	2,468	121	79	4
Louisiana	15.1	16.6	59	74	91	1,478	59	45	2
Maine	14.4	36.9	37	52	81	1,048	54	40	2
Maryland	90.0	27.2	285	375	629	7,407	445	321	17
Massachusetts	39.0	24.4	290	329	470	4,798	317	252	11
Michigan	174.0	26.6	339	513	664	6,613	414	13	13
Minnesota	136.5	58.4	152	289	418	3,748	246	177	10
Mississippi	40.2	81.7	31	71	91	1,346	71	41	2
Missouri	17.9	17.0	167	185	207	2,893	135	110	3
Montana	13.6	38.6	13	26	39	425	23	16	1
Nebraska	16.1	45.3	43	59	72	782	43	34	1
Nevada	4.7	44.9	140	144	249	3,314	171	133	7
New Hampshire	1.4	2.4	51	53	83	962	54	43	2
New Jersey	89.6	24.1	383	472	672	7,599	470	352	17
New Mexico	31.3	49.9	37	68	93	1,171	68	48	2
New York	59.8	16.7	424	484	547	5,408	392	316	10
North Carolina	206.2	21.1	279	486	834	10,119	602	367	25
North Dakota	4.5	39.2	7	11	15	166	8	6	0
Ohio	313.4	53.5	445	758	1,013	12,331	633	451	19
Oklahoma	46.8	20.2	74	121	169	2,961	103	74	4
Oregon	343.8	40.9	119	462	856	11,107	537	376	24
Pennsylvania	227.5	29.8	406	633	910	10,427	621	450	22
Rhode Island	5.4	13.7	35	40	70	773	46	35	2
South Carolina	40.9	12.2	135	176	307	4,592	212	128	9
South Dakota	8.1	42.6	9	17	21	222	12	8	0
Tennessee	162.2	55.1	160	323	548	9,408	329	226	15
Texas	207.1	14.4	601	808	1,188	16,438	757	564	30
Utah	26.3	21.2	52	78	116	1,482	80	58	3
Vermont	7.5	31.8	20	27	41	440	27	20	1
Virginia	72.7	31.9	320	393	595	8,282	396	300	15
Washington	149.4	36.6	205	355	527	6,264	374	271	13
West Virginia	16.1	57.5	31	47	61	1,232	32	25	1
Wisconsin	66.4	27.2	177	243	374	3,938	236	178	9
Wyoming	2.4	36.4	12	15	20	202	12	10	0
Total All States	4,631.2	27.2	9,919	14,550	21,020	259,224	14,120	9,931	516

See next page for notes to table.

* Values expressed in 2004 dollars (GDP Implicit Price Deflator).
Note: Missing values for some states were estimated at national average. Percentage of landscape services for tree care: 27.05%.
Sources: Census of Agriculture or ERS Floriculture & Nursery Outlook (nursery output); National Nursery Survey, 2004 (percentage of nursery output for trees); 2002 Economic Census (share of landscape services for tree care).

In the leading states of California and Florida, tree production represented 19 and 18 percent, respectively, of total nursery and greenhouse output. For California, output impacts of urban forestry were in excess of $3 Bn, employment impacts were 37,769 jobs, and value added impacts were $2.11 Bn, while in Florida, output impacts were $1.55 Bn, employment impacts were 21,946 jobs, and value added impacts were $1.12 Bn. Other states with large value added impacts for urban forestry included Texas ($757 Mn), Ohio ($633 Mn), Pennsylvania ($621 Mn), North Carolina ($602 Mn), Illinois ($568 Mn), Oregon ($537 Mn), New Jersey ($470 Mn) and Maryland ($445 Mn).

Other Economic Benefits of Urban Forestry

In addition to these impacts on nursery production and landscape services, trees and landscaping have important effects on residential and commercial property values. Most of the studies reported in the literature have evaluated variation in sales prices for properties in relation to a variety of influencing variables, such as location, building size, neighborhood features, transportation access, etc. These investigations are generally known among professional economists as "hedonic pricing" or "revealed preference" studies. Typically, the studies are conducted within a limited geographic area to control for dominating variables such as income or demographic composition. Payne (1973), who was one of the first researchers in this area, reported a 7 percent premium on average for the market value of a single-family residence due to the presence of "arborescent vegetation" (trees). The premium ranged from 5 to 15 percent. However, there was a ceiling on the positive effect of trees; beyond more than about 30 trees on a residential lot or more than 67 percent wooded cover, values were reduced. A study conducted in Manchester, CT found that good tree cover increased sale prices for homes by 6 to 9 percent (Morales, Boyce and Favretti, 1976). Also, Siela and Anderson (1982) reported that new homes on tree-planted lots commanded 7 percent higher prices than bare lots.

A study of 800 single-family home sales during 1978-80 in Athens GA concluded that the presence of trees in the front yard added 3 to 5 percent to the sales price (Anderson and Cordell, 1985). In a second study by the same authors in a lower-priced neighborhood also found a 3.5 to 4.5 percent premium in sales value for homes with intermediate to large trees (Anderson and Cordell, 1988). It was further reported that each evergreen or broad-leaved tree contributes about $319 to $376, respectively, in value to the home. In a study of 269 single-family house sales with an average price of $93,272, it was found that the presence of mature trees contributed about 2 percent to the home value (Dombrow, Rodriguez and Sirmans, 2000). A study by Henry in 1999 estimated the contribution of the quality of landscaping to house prices for a sample of 218 home sales in Greenville, SC from 1996 to 1997. For homes with the same square footage and other house characteristics, selling prices were six to seven percent higher if landscaping was judged excellent rather than good. The price premium obtained by upgrading landscaping from average to good was approximately four to five percent. Finally, in perhaps the most sophisticated investigation of its kind to date, DeRosiers, Therialut, Kestens and Villeneuve (2002) examined 760 single-family home sales in Quebec, Canada, between 1993 and 2000. It was found that a positive differential of tree cover between a property and its immediate neighborhood raised the property value by about 0.2 percent for each percentage point difference. The higher the proportion of retired people in the neighborhood, the more beneficial was the presence of trees, while it was less so for neighborhoods with a predominance of people aged 45-64. For small homes (bungalows and cottages), a high percentage of ground covers and landscape features such as flower beds contributed more value than did a tree canopy. This investigation also found that an excessive tree cover may negatively impact values, consistent with earlier studies.

Well-maintained trees also increase the "curb appeal" of properties. Research comparing sales prices of residential properties with different tree resources suggests that people are willing to pay 3 to 7 percent more for properties with tree resources versus few or no trees. One of the most comprehensive studies of the influence of trees on residential property values was based on actual sales prices and found that each large front-yard tree was

associated with about a 1 percent increase in home sales prices (Anderson and Cordell 1988). A much greater value of 9 percent ($15,000) was determined in a U.S. Tax Court case for the loss of a large black oak on a property valued at $164,500 (Neely 1988). Depending on average home sales prices, the value of this benefit can contribute significantly to cities' property tax revenues.

A study was conducted in 1999 regarding consumer perspectives on the value of the components in a "good" landscape and which attributes of a landscape that consumers valued most (Hardy et al. 2000). Using conjoint design, 1323 volunteer participants in seven states viewed 16 photographs that depicted the front of a landscaped residence. Landscapes were constructed using various levels of three attributes: plant material type, design sophistication, and plant size. Results showed that the relative importance increased from plant material type to plant size to design sophistication. Across all seven markets, study participants perceived that home value increased from 5% to 11% for homes with a good landscape.

Trees sold to municipalities for use in urban forest settings (e.g. parks and other recreational areas) have other economic and environmental benefits beyond those mentioned above. Once they have been installed into the urban landscape, they can result in substantial energy savings; reduction of atmospheric carbon dioxide; improved air quality; reduction of stormwater runoff and hydrology; and enhanced aesthetic benefits.

Street trees modify climate and conserve building energy use in three principal ways: (1) through shading that reduces the amount of radiant energy absorbed and stored by built surfaces; (2) through transpiration that converts moisture to water vapor and thus cools by using solar energy that would otherwise result in heating of the air; and (3) through wind speed reduction that reduces the infiltration of outside air into interior spaces and conductive heat loss where thermal conductivity is relatively high such as glass windows (Simpson 1998). Buildings and pavement, along with little canopy and/or soil cover, increase the ambient temperatures within a city. Research shows that even in moderated climates, temperatures in urban centers are steadily increasing by approximately 0.5°F per decade. Winter benefits of this warming do not compensate for the detrimental effects of magnifying summertime temperatures. Because electric demand of cities increases about 1 to 2 percent per 1°F increase in temperature, approximately 3 to 8 percent of current electric demand for cooling is used to compensate for this urban heat island effect of the last four decades (Akbari et al. 1992). Warmer temperatures in cities, compared to surrounding rural areas, have other implications. Increases in CO2 emissions from fossil fuel power plants, municipal water demand, unhealthy ozone levels, and human discomfort and disease are all symptoms associated with urban heat islands. In many areas, there are opportunities to ameliorate these problems through strategic tree planting and stewardship of existing trees allowing for streetscapes that reduce stormwater runoff, conserve energy and water, sequester CO2, attract wildlife, and provide other aesthetic, social, and economic benefits through urban renewal developments.

Tree spacing, crown spread, and vertical distribution of leaf area influence the transport of cool air and pollutants along streets and out of urban canyons. For individual buildings, street trees can increase energy efficiency in the summer and winter, depending on placement. Solar angles are important when the summer sun is low in the east and west for several hours each day. Tree shade to protect east and west walls help keep buildings cool. In the winter, solar access on the southern side of buildings can warm interior spaces. Rates at which outside air infiltrates a building can increase substantially with wind speed. In cold, windy weather, the entire volume of air in a poorly sealed home may change two to three times per hour. Even in newer or tightly sealed homes, the entire volume of air may change every two to three hours. Trees can reduce wind speed and resulting air infiltration by up to 50 percent, translating into potential annual heating savings of 25 percent (Heisler 1986). Reductions in wind speed reduce heat transfer through conductive materials as well. Cool winter winds, blowing against single-pane windows, can contribute significantly to the heating load of homes and buildings by increasing the temperature gradient between inside and outside temperatures. Trees reduce air infiltration and conductive heat loss from buildings.

Urban forests can also reduce atmospheric carbon dioxide (CO2) in the environment. Trees directly sequester CO2 as woody and foliar biomass while trees grow and trees near buildings can reduce the demand for heating and air conditioning, thereby reducing emissions associated with electric power production. On the other hand, vehicles, chain saws, chippers, and other equipment release CO2 during the process of planting and maintaining trees. And eventually, all trees die and most of the CO2 that has accumulated in their woody biomass is released

into the atmosphere through decomposition. The combustion of gasoline and diesel fuels by vehicle fleets, and equipment such as chainsaws, chippers, stump removers, and leaf blowers is a relatively minor source of CO2. Typically, CO2 released due to tree planting, maintenance, and other program-related activities is about 2 to 8 percent of annual CO2 reductions obtained through sequestration and avoided power plant emissions (McPherson and Simpson 1999).

Urban trees also provide air quality benefits. They absorb gaseous pollutants (e.g., ozone, nitrogen oxides, and sulfur dioxide) through leaf surfaces; intercept particulate matter (e.g., dust, ash, pollen, and smoke); reduce emissions from power generation by limiting building energy consumption; release oxygen through photosynthesis; and transpire water and shade surfaces, which lowers local air temperatures, thereby reducing ozone levels. In the absence of the cooling effects of trees, higher air temperatures contribute to ozone formation. Most trees emit various biogenic volatile organic compounds (BVOC) such as isoprenes and monoterpenes that can contribute to ozone formation. The ozone-forming potential of different tree species varies considerably. A computer simulation study for the Los Angeles basin found that increased tree planting of low BVOC emitting tree species would reduce ozone concentrations and exposure to ozone, while planting of medium- and high-emitters would increase overall ozone concentrations (Taha 1996).

Studies that have simulated urban forest effects on stormwater report annual runoff reductions of 2 to 7 percent. Annual interception of rainfall by Sacramento's urban forest for the urbanized area was only about 2 percent due to the winter rainfall pattern and predominance of non-evergreen species (Xiao et al. 1998). However, average interception on land with tree canopy cover ranged from 6 to 13 percent (150 gallons per tree on average), close to values reported for rural forests. In Modesto, California, each street and park tree was estimated to reduce stormwater runoff by 845 gallons annually, with a benefit valued at $7 per tree (McPherson et al. 1999b). A typical medium-sized tree in coastal southern California was estimated to intercept 2,380 gallons ($5) annually (McPherson et al. 2000). These studies showed that broadleaf evergreens and conifers intercept more rainfall than deciduous species where winter rainfall patterns prevail.

Trees provide a host of aesthetic, social, economic, and health advantages that should be included in any benefit-cost analysis. One of the most frequently cited reasons that people plant trees is for beautification. Trees add color, texture, line, and form to the landscape. In this way, trees soften the hard geometry that dominates built environments. Research on the aesthetic quality of residential streets has shown that street trees are the single strongest positive influence on scenic quality (Schroeder and Cannon 1983). Consumer surveys have found that preference ratings increase with the presence of trees in the commercial streetscape. In contrast to areas without trees, shoppers indicated that they shop more often and longer in well-landscaped business districts, and were willing to pay more for goods and services (Wolf 1999). Research in public housing complexes found that outdoor spaces with trees were used significantly more often than spaces without trees. By facilitating interactions among residents, trees can contribute to reduced levels of domestic violence, as well as foster safer and more sociable neighborhood environments (Sullivan and Kuo 1996). Scientific studies confirm our intuition that trees in cities provide social and psychological benefits. Humans derive substantial pleasure from trees, whether it is inspiration from their beauty, a spiritual connection, or a sense of meaning (Dwyer et al. 1992; Lewis 1996). Following natural disasters, people often report a sense of loss if the urban forest in their community has been damaged (Hull 1992).

Views of trees and nature from homes and offices provide restorative experiences that ease mental fatigue and help people to concentrate (Kaplan & Kaplan 1989). Desk-workers with a view of nature report lower rates of sickness and greater satisfaction with their jobs compared to those having no visual connection to nature (Kaplan 1992). Trees provide important settings for recreation and relaxation in and near cities. The act of planting trees can have social value, for community bonds between people and local groups often result. The presence of trees in cities provides public health benefits and improves the well-being of those who live, work and recreate in cities. Physical and emotional stress has both short term and long-term effects. Prolonged stress can compromise the human immune system. A series of studies on human stress caused by general urban conditions and city driving show that views of nature reduce stress response of both body and mind (Parsons et al. 1998). City nature also appears to have an "immunization effect," in that people show less stress response if they've had a recent view of trees and vegetation. Hospitalized patients with views of nature and time spent outdoors need less medication, sleep better, and have a better outlook than patients without connections to nature (Ulrich 1985).

Trees reduce exposure to ultraviolet light, thereby lowering the risk of harmful effects from skin cancer and cataracts (Tretheway and Manthe 1999).

Certain environmental benefits from trees are more difficult to quantify than those previously described, but can be just as important. Noise can reach unhealthy levels in cities. Trucks, trains, and planes can produce noise that exceeds 100 decibels, twice the level at which noise becomes a health risk. Thick strips of vegetation in conjunction with landforms or solid barriers can reduce highway noise by 6-15 decibels. Plants absorb more high frequency noise than low frequency, which is advantageous to humans since higher frequencies are most distressing to people (Miller 1997). Although urban forests contain less biological diversity than rural woodlands, numerous types of wildlife inhabit cities and are generally highly valued by residents. For example, older parks, cemeteries, and botanical gardens often contain a rich assemblage of wildlife. Street tree corridors can connect a city to surrounding wetlands, parks, and other greenspace resources that provide habitats that conserve biodiversity (Platt et al. 1994).

Urban forestry also provides jobs for both skilled and unskilled labor. In 2002, there were 262,242 full-time parks and recreation employees across the nation. Public service programs and grassroots-led urban and community forestry programs provide horticultural training to volunteers across the U.S. Also, urban and community forestry provides educational opportunities for residents who want to learn about nature through first-hand experience (McPherson and Mathis 1999). Local nonprofit tree groups, along with municipal volunteer programs, often provide educational materials; work with area schools; and provide hands-on training in the care of trees.

8. Literature and Information Sources Cited

Akbari, H.; Davis, S.; Dorsano, S.; Huang, J.; Winnett, S., eds. 1992. *Cooling Our Communities: A Guidebook on Tree Planting and Light-Colored Surfacing*. Washington, DC: U.S. Environmental Protection Agency.; 26 p.

Alden, H.A. 1995. *Hardwoods of North America*. USDA Forest Service, FPL General Technical Report No. 83. Madison, WI. 136 p.

Anderson, L.M. and H.K. Cordell. 1988. Influence of trees on residential property values in Athens, Georgia. *Landscape and Urban Planning* 15:153-64.

Anderson, L.M. and H.K. Cordell. 1988. Residential property values improved by landscaping with trees. *Southern Journal of Applied Forestry* 9:162-166.

Arizona Agricultural Statistics Service. 2002 Arizona Green Industry Survey. OMB No. 0535-0227. Available at http://www.nass.usda.gov/az.

Bartenstein, F. 1981. The future of urban forestry. *J. Arboric.* 7(10):261-267.

Borden, Buddy and R.R. Fletcher. Economic Contribution of Nevada's Green Industry Operations on the State of Nevada, 2002. September 2003, UCED 2003/04-13

Bradley, G. 1995.*Urban Forest Landscapes: Integrating Multidisciplinary Perspectives*. Seattle: Univ. of WA Press.

Brumfield, Robin, *Economic and Marketing Issues from a Grower's Perspective*, Agricultural Outlook Forum 2003, presented Friday, February 21, 2003.

Butterfield, Bruce, *National Gardening Survey 2003*, National Gardening Association, Available at http://www.gardenresearch.com.

Campbell, Dr. Gene. The Illinois Green Industry Brochure. College of Agricultural, Consumer and Environmental Sciences. University of Illinois at Urbana-Champaign. Available at http://research.nres.uiuc.edu/report01-01.

Cox, Linda J. An Update on the Economic Role of Hawaii's Landscape Service. Cooperative Extension Service. University of Hawaii, Manoa. Economic Issues January 2003 EI-5. Available at http://www.ctahr.hawaii.edu/oc/freepubs/pdf/EI-5.pdf.

Danekas, Gene, M. Schlegel, M. Brown, C. Mends, and B. Gorman. 2000 Missouri Nursery Survey. Missouri Agricultural Statistics Service. December 2001. Available at http://agebb.missouri.edu/mass/massnursery.pdf.

Des Rosiers, F., M. Theriault, Y. Kestens and P. Villeneuve. 2002. Landscaping and house values: an empirical investigation. *Journal of Real Estate Research*. 23 (1-2): 139-161.

Dombrow, J., M. Rodriguez and C.F. Sirmans. 2000. The market value of mature trees in single-family housing markets. *The Appraisal Journal*. 68: 39-43.

Dwyer, J.F., E.G. McPherson, H.W. Schroeder and R.A. Rowntree. 1992. Assessing the benefits and costs of the urban forest. *Journal of Arboriculture* 18(5):227-234.

Florkowski, W.J. and G. Landry. An Economic Profile of the Professional Turfgrass and Landscape Industry in Georgia. The University of Georgia. Research Report Number 672. December 2000. Available at http://pubs.caes.uga.edu/caespubs/pubs/PDF/RR672.pdf.

Gao, G., J. Smith, and J. Chatfield. 2001 Ohio Green Industry Survey. The Ohio State University Extension. June 2002. Available at http://www.onla.org/FinalReportONLA.pdf.

Green Industry Research Consortium (S-290 Multi-State Research Committee) Fourth National Nursery Industry Survey, www.s290.org.

Hardy, J., B. Behe, S. Barton, T. Page, R. Schutzki, K. Muzii, T. Fernandez, T. Haque, J. Brooker, C. Hall, R. Hinson, P. Knight, R. McNiel, D. Rowe, and C. Safley. "Consumer Preferences for Plant Size, Type of Plant Material and Design Sophistication in Residential Landscaping." *Journal of Environmental Horticulture*. 18-4 (December 2000): 224-230

Heisler, G.M. 1986. Energy savings with trees. *Journal of Arboriculture*. 12(5):113-125.

Henry, Mark S. "Landscape Quality and the Price of Single Family Houses: Further Evidence from Home Sales in Greenville, South Carolina," *J. Env. Hort*. 17(1):25-30, March 1999.

Hinson, Roger A., R. Pinel, and D.W. Hughes. Louisiana's Green Industry: Evaluation of its Economic Contribution. September 2003. Research Information Sheet #108. Available at http://www.lsuagcenter.com.

Hughes, David W. and R.A. Hinson. The Value of the Ornamental Plants and Turfgrass Industries to the Louisiana Economy. D.A.E. Research Series No. 708. February 1997.
Hull, R.B. 1992. How the public values urban forests. *J. Arboric.* 18(2):98-101.
Jerardo, Alberto, *Floriculture and Nursery Crops Outlook*, USDA-ERS FLO-03, September 2004, [www.ers.usda.gov/Briefing/floriculture].
Jerardo, Alberto, *Floriculture and Nursery Crops Situation and Outlook Yearbook*, USDA-ERS FLO2004, June 2004, [www.ers.usda.gov/Briefing/floriculture].
Jull, Dr. Laura G. Economic Impact of Wisconsin's Green Industry. 2002.
Kaplan, R. and S. Kaplan. 1989. *The Experience of Nature: A Psychological Perspective*. Cambridge University Press, Cambridge, UK.
Lawn & Landscape Magazine, *2004 State of the Industry Report*, October 13, 2004, Available at http://www.lawnandlandscape.com.
Lewis, C.A. 1996. *Green Nature/Human Nature: The Meaning of Plants in Our Lives*. University of Illinois Press, Chicago, IL.
Maco, S.E. 2003. A practical approach to assessing structure, function, and value of street tree populations in small communities. *J. Arboric.* 29(2):84-97.
McPherson, E. G. 1984. *Planting design for solar control, chapter 8. In Energy Conserving Site Design*, Am. Soc. Landscape Archit., Washington, D.C. p.141-164.
McPherson, E. G. 2005. "Trees with Benefits," *American Nurseryman*, Volume 201, Issue 7, April 1, 2005.
McPherson, E.G. 1993. Evaluating the cost effectiveness of shade trees for demand-side management. *The Electricity Journal* 6(9): 57-65.
McPherson, E.G. and J.R. Simpson. 1999. *Guidelines for Calculating Carbon Dioxide Reductions Trough Urban Forestry Programs.* USDA Forest Service, PSW General Technical Report No. 171, Albany, CA.
McPherson, E.G. and J.R. Simpson. 2002. *A comparison of municipal forest benefits and costs in Modesto and Santa Monica, California, USA*. Urban For. Urban Green. 1(2002):61-74.
McPherson, E.G., J.R. Simpson, P.J. Peper and Q. Xiao. 1999. Benefit-cost analysis of Modesto's municipal urban forest. *Journal of Arboriculture*. 25(5):235-248.
McPherson, E.G., K.I. Scott and J.R. Simpson. 1998. Estimating cost effectiveness of residential yard trees for improving air quality in Sacramento, California, using existing models. *Atmospheric Environment* 32(2):75-84.
MIG, Inc. *Implan* 2001 50 State Data Package. Stillwater, Mn, Jan. 2004.
MIG, Inc. *Implan* Professional, version 2.0, *Social Accounting & Impact Analysis Software: User's Guide, Analysis Guide and Data Guide*. Stillwater, Mn, 418pp., Apr.1999.
Miller, Marvin, *Opportunities and Challenges for Floricultural Producers Selling to a Changing Marketplace*, Agricultural Outlook Forum 2003, presented Friday, February 21, 2003.
Miller, R.E. and P.D. Blair. *Input-output analysis: Foundations and extensions*. Prentice-Hall, Englewood Cliffs, NJ, 464pp., 1985.
Morales, D., B.N. Boyce and R.J. Favretti. 1976. The contribution of trees to residential property value: Manchester, Connecticut. *Valuation.* 23 (2): 26-43.
National Nursery Survey. S-290 Multi-state project USDA/CSREES. Unpublished data analyzed by Alan Hodges, University of Florida, 2005.
Neely, D., ed. 1988. *Valuation of Landscape Trees, Shrubs, and Other Plants*. Seventh ed. Urbana, IL: International Society of Arboriculture. 50 p.
NEWAZ GreenIndBro.qxp. The Economic Impact of Arizona's Green Industry. May 10, 2004. Available at http://www.nass.usda.gov/az.
Orland, Vining & Ebreo. 1992. The Effect of Street Trees on Perceived Values of Residential Property. *Environment and Behavior*, 24(3)298-325.
Parsons, R., L.G. Tassinary, R.S. Ulrich, M.R. Hebl and M. Grossman-Alexander. 1998. The view from the road: implications for stress recovery and immunization. *Journal of Environmental Psychology* 18(2):113-140.
Payne, B.R. 1973. The twenty-nine tree home improvement plan. *Natural History.* 82: 74-5.
Payne, B.R. and S. Strom. 1975. The contribution of trees to the appraised value of unimproved residential land. *Valuation.* 22(2): 36-45.
Perry, Dr. Leonard and Dr. N. Hampton. "Minnesota's Nursery and Landscape Industry". Minnesota Nursery and Landscape Association. 2002 Minnesota Nursery and Landscape Industry Economic Impact Study.

Platt, R.H., R.A Rowntree and P.C. Muick, eds. 1994. *The Ecological City*. Boston, MA, University of Massachusetts. 292 p.

Rathwell, P. James, M.G. Evatt, and M.S. Henry. Contributions of the Ornamental Horticulture and Turfgrass Industry to the South Carolina Economy, 1999, EER 194, Department of Agricultural and Applied Economics, Clemson University, April 2001.

Schroeder, H.W. and W.N. Cannon. 1983. The esthetic contribution of trees to residential streets in Ohio towns. *Journal of Arboriculture*. 9: 237-243.

Scott, K.I., E.G. McPherson, and J.R. Simpson. 1998. Air pollutant uptake by Sacramento's urban forest. *Journal of Arboriculture* 24(4):224-234.

Simpson, J.R. 1998. Urban forest impacts on regional space conditioning energy use: Sacramento County case study. *Journal of Arboriculture* 24(4): 201-214.

Sullivan, W.C. and E.E. Kuo. 1996. Do trees strengthen urban communities, reduce domestic violence? *Arborist News*. 5(2):33-34.

Taha, H. 1996. Modeling impacts of increased urban vegetation on odistrict air quality in the South Coast Air Basin. *Atmospheric Environment* 30: 3423-3430.

Templeton, Scott R., and G. Goldman. Estimating Economic Activity and Impacts of Urban Forestry in California with Multiple Data Sources from the Early 1990s. International Society of Arboriculture. Volume 22, No. 3. May 1996. Available at http://www.isa-arbor.com/publications/joaAbstracts/joamay96.html.

Thilmany, Dawn. The Economic Contribution of Colorado's Green Industry-Phase I: Allied Industry and Sector-Specific Revenue and Employment Trends. Department of Agricultural and Resource Economics. Colorado State University.

Tretheway, R. and A. Manthe. 1999. Skin cancer prevention: another good reason to plant trees. In McPherson, E.G. and Mathis, S. *Proceedings of the Best of the West Summit.* University of California, Davis, CA.

U.S. Census Bureau. Annual Estimates of the Population for the United States and States, and for Puerto Rico. April 1, 2000 to July 1, 2004 (NST-EST2004-01). Population Division, December 22, 2004.

U.S. Census Bureau. *2002 County Business Patterns, EPCD, County & State Database on NAICS Basis.* United States Department of Commerce, Washington, D.C.. Available at http://www.census.gov/epcd/cbp/view/cbpview.html, accessed Dec. 2004.

U.S. Census Bureau. *Annual Benchmark Report for Retail Trade and Food Services: January 1992 through February 2004.* Current Business Reports BR/03-A. U.S. Department of Commerce, Washington, D.C., Mar. 2004.

U.S. Census Bureau. *Annual Benchmark Report for Wholesale Trade: January 1992 through December 2003.* Current Business Reports BW/03-A. U.S. Department of Commerce, Washington, D.C., Mar. 2004.

U.S. Census Bureau. *Architectural, Engineering and Related Services, 2002 Economic Census, Professional, Scientific and Technical Services Industry Series, EC02-541-03.* United States Department of Commerce, Washington, D.C., Oct. 2004.

U.S. Census Bureau. *Building Material and Supplies Dealers, 2002 Economic Census, Retail Trade Industry Series, EC02-441-18.* United States Department of Commerce, Washington, D.C., Nov. 2004.

U.S. Census Bureau. *Farm, Floral and Nursery Supplies, 2002 Economic Census, Wholesale Trade Industry Series, EC02-421-15.* United States Department of Commerce, Washington, D.C., Nov. 2004.

U.S. Census Bureau. *Florists, 2002 Economic Census, Retail Trade Industry Series, EC02-441-16.* United States Department of Commerce, Washington, D.C., Aug. 2004.

U.S. Census Bureau. *Food and Beverage Stores, 2002 Economic Census, Retail Trade Industry Series, EC02-441-07.* United States Department of Commerce, Washington, D.C., Sep. 2004.

U.S. Census Bureau. *General Merchandise Stores, 2002 Economic Census, Retail Trade Industry Series, EC02-441-11.* United States Department of Commerce, Washington, D.C., Oct. 2004.

U.S. Census Bureau. *Lawn and Garden Equipment & Supplies Stores, 2002 Economic Census, Retail Trade Industry Series, EC02-441-08.* United States Department of Commerce, Washington, D.C., Sep. 2004.

U.S. Census Bureau. *Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing, 2002 Economic Census, Manufacturing Industry Series, EC02-311-333112 (RV).* United States Department of Commerce, Washington, D.C., Dec. 2004.

U.S. Census Bureau. *Machinery, Equipment and Supplies, 2002 Economic Census, Wholesale Trade Industry Series, EC02-421-09.* United States Department of Commerce, Washington, D.C., Sep. 2004.

U.S. Census Bureau. *Prefabricated Metal Building and Component Manufacturing, 2002 Economic Census, Manufacturing Industry Series, EC02-311-332311 (RV).* United States Department of Commerce, Washington, D.C., Jan. 2005.
U.S. Census Bureau. *Services to Buildings and Dwellings, 2002 Economic Census, Administrative and Support and Waste Management and Remedial Services Industry Series, EC02-561-07.* United States Department of Commerce, Washington, D.C., June 2004.
U.S. Department of Agriculture, National Agricultural Statistics Service. *2002 Census of Agriculture. United States Summary and State Data, Vol. 1, Geographic Area Series, Part 51, AC-02-A-51*. United States Department of Agriculture, Washington, D.C., June 2004.
U.S. Department of Agriculture, National Agricultural Statistics Service, *Floriculture Crops 2003 Summary*, April 2004, Available at http://www.nass.usda.gov.
U.S. Department of Agriculture, National Agricultural Statistics Service, *Nursery Crops 2003 Summary*, July 2004, Available at http://www.nass.usda.gov.
U.S. Department of Commerce. Gross Domestic Product: Implicit Price Deflator, 1970-2004, Annual. Available at http://research.stlouisfed.org/fred/data/gdp/gdpdef.
U.S. Department of Commerce. Gross Domestic Product Implicit Price Deflators (quarterly). Bureau of Economic Analysis, Washington, D.C. Dec. 22, 2004. Available at http://research.stlouisfed.org/fred/data/gdp/gdpdef.
U.S. Landscape Tree Planting Survey, American Nursery & Landscape Association and the USDA Forest Service, conducted by the National Gardening Association. Available at http://www.anla.org/pdffiles/survey.pdf, retrieved January 2004.
Ulrich, R. S. 1985. Human responses to vegetation and landscapes. Landscape and Urban Planning 13: 29-44.
University of Illinois at Urbana-Champaign. The Illinois Green Industry. Department of Natural Resources and Environmental Sciences. Available at http://research.nres.uiuc.edu/report01-01/toc.html.
University of Vermont and the University of Maine. The Connecticut Green Industry & The Connecticut Economy. February 2003. Available at http://www.flowersplantsinct.com/pdf/EconomicImpact.pdf.
Watson, Phillip, S. Davies, and D. Thilmany. The Economic and Environmental Aspects of Colorado's Golf Industry.
Willits, Fern K. and M. Shields. Pennsylvania's Green Industry: Its Nature and Contribution to the State's Economy. Department of Agricultural Economics and Rural Sociology, Pennsylvania State University, University Park, PA, 2001.
Wisniewski, Nicole. Nevada Green Industry Contributes $1.3 billion to the State's Economy. Lawn and Landscape, 7/30/2004. Available at http://www.lawnandlandscape.com/News/news.asp?Id=2560.
Wolf, K.L. 1999. Nature and commerce: human ecology in business districts. *In* C. Kollin (Ed), Building Cities of Green: *Proceedings of the 1999 National Urban Forest Conference*. Washington, D.C. American Forests; 56-59.
Wray, P.H. and D.R. Prestemon. 1983. Assessment of street trees in Iowa's small communities. Iowa State *Journal of Research*. 58(2):261-268.
Wulfhorst, Dr. J.D. and J. Nelson. The Green Industry of Idaho. Social Science Research Unit, University of Idaho, July 2001.
Xiao, Q., E.G. McPherson, J.R. Simpson and S.L Ustin. 1998. Rainfall interception by Sacramento's urban forest. *Journal of Arboriculture.*

Appendix A--Economic Multipliers for the U.S. Green Industry Sectors

Appendix Table A-1. Multipliers for the Nursery and Greenhouse Sector

State	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
Alabama	1.0000	0.0138	0.9627	10.0716	0.1517	12.4493	0.9806	0.0087	0.5680
Alaska	1.0000	0.2405	0.6367	6.9822	2.2494	7.9460	0.5387	0.1286	0.4360
Arizona	1.0000	0.0887	1.1240	4.7669	1.1851	13.2398	0.8576	0.0523	0.6795
Arkansas	1.0000	0.0686	0.8536	8.8633	0.8414	11.8816	0.9002	0.0357	0.4852
California	1.0000	0.2452	1.2352	7.6564	2.5024	12.3251	0.7122	0.1381	0.7684
Colorado	1.0000	0.2781	1.1559	5.1514	2.8823	12.7265	0.6105	0.1587	0.7082
Connecticut	1.0000	0.0123	0.9990	11.9537	0.1086	9.8177	0.9806	0.0082	0.6279
Delaware	1.0000	0.0107	0.8625	5.2486	0.1031	9.5756	0.9806	0.0058	0.4777
Florida	1.0000	0.0506	1.3196	11.0630	0.6775	15.6132	0.9340	0.0326	0.8040
Georgia	1.0000	0.0138	1.2438	6.7008	0.1384	13.9947	0.9806	0.0085	0.7596
Hawaii	1.0000	0.0461	1.2567	15.2817	0.5506	16.0437	0.9262	0.0283	0.8468
Idaho	1.0000	0.0121	1.0397	5.8911	0.1811	15.0342	0.9806	0.0073	0.6278
Illinois	1.0000	0.2825	1.1046	5.5685	2.2010	11.4449	0.6263	0.1513	0.6655
Indiana	1.0000	0.2931	0.7993	6.9067	2.8990	9.6792	0.5697	0.1482	0.4550
Iowa	1.0000	0.3099	0.6446	4.3094	3.5665	8.5764	0.4743	0.1629	0.3721
Kansas	1.0000	0.4025	0.7166	4.3825	3.8081	9.1713	0.4222	0.1964	0.4150
Kentucky	1.0000	0.0590	0.8568	15.7775	0.7674	10.8581	0.9111	0.0324	0.4945
Louisiana	1.0000	0.1925	0.8690	11.2600	2.0092	11.7970	0.6971	0.1000	0.5193
Maine	1.0000	0.1089	0.9014	12.5596	1.5805	12.6316	0.7853	0.0638	0.5372
Maryland	1.0000	0.0556	1.3375	8.6240	0.5121	15.0707	0.9042	0.0358	0.8800
Massachusetts	1.0000	0.2388	0.9664	19.7582	2.2071	9.7408	0.6108	0.1449	0.6075
Michigan	1.0000	0.3241	0.8163	9.3898	3.2341	8.9356	0.5090	0.1811	0.4717
Minnesota	1.0000	0.3785	0.9383	5.3138	3.4583	10.6843	0.4687	0.2027	0.5559
Mississippi	1.0000	0.0140	0.8944	12.0558	0.1667	12.7023	0.9806	0.0074	0.5274
Missouri	1.0000	0.3312	0.9235	11.9260	3.9309	11.4019	0.5243	0.1858	0.5467
Montana	1.0000	0.2274	0.6610	5.8150	2.6883	9.9243	0.5392	0.1098	0.3944
Nebraska	1.0000	0.2772	0.7011	3.0697	3.0804	9.3944	0.4488	0.1491	0.4114
Nevada	1.0000	0.0091	1.1471	6.7480	0.1111	12.6026	0.9806	0.0054	0.7101
New Hampshire	1.0000	0.2508	0.8996	17.4168	2.9685	10.4967	0.6143	0.1508	0.5304
New Jersey	1.0000	0.1144	0.8814	14.6176	0.9297	8.5973	0.8390	0.0667	0.5537
New Mexico	1.0000	0.0641	1.0139	5.4760	0.8715	14.3807	0.9031	0.0337	0.6365
New York	1.0000	0.1471	0.8323	8.4013	1.1874	8.2927	0.7335	0.0879	0.5313
North Carolina	1.0000	0.0135	1.0810	5.0395	0.1432	13.1926	0.9806	0.0086	0.6360
North Dakota	1.0000	0.2983	0.4694	3.7344	2.9328	6.9018	0.3862	0.1378	0.2775
Ohio	1.0000	0.2732	0.7432	10.3194	2.7486	8.8566	0.5800	0.1412	0.4321
Oklahoma	1.0000	0.3647	0.9112	12.8865	4.7810	12.2900	0.5553	0.1878	0.5383
Oregon	1.0000	0.3294	0.9778	13.8836	4.2927	12.2179	0.6255	0.1961	0.5969
Pennsylvania	1.0000	0.1821	1.1103	10.6688	1.6047	12.2233	0.7525	0.1004	0.6635
Rhode Island	1.0000	0.1877	0.6967	15.3068	2.0839	8.4742	0.6193	0.1073	0.4414
South Carolina	1.0000	0.0127	0.9736	10.8809	0.1444	12.6953	0.9806	0.0083	0.5816
South Dakota	1.0000	0.2270	0.6427	3.3676	2.5886	9.2002	0.5031	0.1226	0.3712
Tennessee	1.0000	0.3834	0.9055	27.1515	5.4979	10.7726	0.5292	0.2087	0.5297
Texas	1.0000	0.3805	1.1091	11.9364	3.7715	12.0449	0.5917	0.2066	0.6634
Utah	1.0000	0.0957	1.3284	9.4921	1.0876	17.5553	0.8639	0.0523	0.7882
Vermont	1.0000	0.1314	0.8535	7.6434	1.8912	11.9415	0.7577	0.0764	0.5149
Virginia	1.0000	0.1930	1.0200	15.3364	2.0653	11.8871	0.6868	0.1130	0.6547
Washington	1.0000	0.1196	1.0418	10.8278	1.3185	11.5996	0.8467	0.0689	0.6358
West Virginia	1.0000	0.5103	0.4108	34.0957	7.9856	5.9567	0.2380	0.2247	0.2502
Wisconsin	1.0000	0.2804	0.8099	7.2554	3.0855	10.0009	0.5565	0.1514	0.4698
Wyoming	1.0000	0.2662	0.6148	5.2722	3.1226	8.8150	0.5680	0.1310	0.3745

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)

Appendix Table A-2. Multipliers for the Lawn and Garden Equipment Manufacturing Sector

	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
State	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
Alabama	1.0000	0.4429	0.4896	3.2900	3.2506	6.4473	0.2642	0.1947	0.2955
Alaska	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Arizona	1.0000	0.3597	0.5697	3.3277	2.9147	6.8604	0.2575	0.1948	0.3502
Arkansas	1.0000	0.4077	0.3606	3.7138	3.4109	5.1010	0.1886	0.1809	0.2091
California	1.0000	0.4251	0.7547	3.2247	3.0416	7.6171	0.2758	0.2348	0.4736
Colorado	1.0000	0.4800	0.7424	3.4502	3.2811	8.2543	0.2356	0.2564	0.4580
Connecticut	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Delaware	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Florida	1.0000	0.4004	0.6010	3.6538	3.3020	7.2125	0.1993	0.2208	0.3723
Georgia	1.0000	0.4893	0.6673	3.4603	3.4373	7.6435	0.2338	0.2472	0.4158
Hawaii	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Idaho	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Illinois	1.0000	0.5983	0.8371	3.2753	3.7211	8.7408	0.2668	0.3064	0.5073
Indiana	1.0000	0.5382	0.5580	3.3915	3.6417	6.8133	0.2461	0.2472	0.3202
Iowa	1.0000	0.4463	0.4566	3.4311	3.4737	6.1325	0.2390	0.2057	0.2657
Kansas	1.0000	0.3559	0.5204	3.1962	2.8828	6.6860	0.2809	0.1789	0.3016
Kentucky	1.0000	0.4535	0.4209	3.4025	3.3179	5.4188	0.2441	0.1994	0.2467
Louisiana	1.0000	0.2969	0.4392	3.3948	2.5738	6.0465	0.2455	0.1518	0.2653
Maine	1.0000	0.2612	0.4107	3.4019	2.4644	5.8353	0.2442	0.1391	0.2480
Maryland	1.0000	0.3996	0.7288	3.1810	2.6701	8.3104	0.2836	0.2056	0.4839
Massachusetts	1.0000	0.4179	0.6047	3.3937	2.7618	6.1291	0.2457	0.2363	0.3823
Michigan	1.0000	0.3944	0.6655	2.6073	2.5040	7.2272	0.3859	0.1968	0.3826
Minnesota	1.0000	0.4012	0.6899	3.2360	3.0586	7.8939	0.2738	0.2220	0.4103
Mississippi	1.0000	0.4277	0.3940	3.4747	3.2135	5.6533	0.2313	0.1739	0.2351
Missouri	1.0000	0.5442	0.6373	3.5221	4.0671	7.9353	0.2228	0.2629	0.3796
Montana	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nebraska	1.0000	0.3542	0.5503	3.1243	3.0915	7.4316	0.2937	0.1776	0.3248
Nevada	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New Hampshire	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New Jersey	1.0000	0.3708	0.5236	3.1466	2.5061	5.1978	0.2898	0.2142	0.3335
New Mexico	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New York	1.0000	0.5104	0.5425	3.3149	3.0810	5.4801	0.2597	0.2684	0.3495
North Carolina	1.0000	0.4225	0.6117	3.0507	3.0719	7.6010	0.3069	0.2013	0.3690
North Dakota	1.0000	0.2540	0.3334	3.3571	2.4401	4.9355	0.2522	0.1223	0.1981
Ohio	1.0000	0.3979	0.4646	3.2626	2.8137	5.5520	0.2691	0.1792	0.2709
Oklahoma	1.0000	0.4274	0.5572	3.2947	3.3980	7.5753	0.2633	0.1922	0.3315
Oregon	1.0000	0.4077	0.5265	3.4647	3.3702	6.6304	0.2330	0.2249	0.3235
Pennsylvania	1.0000	0.4578	0.7085	3.0258	3.2440	7.8619	0.3113	0.2328	0.4260
Rhode Island	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
South Carolina	1.0000	0.4208	0.4503	3.4422	3.1352	5.9891	0.2370	0.1870	0.2751
South Dakota	1.0000	0.3119	0.4856	2.9975	2.7494	7.0347	0.3164	0.1506	0.2833
Tennessee	1.0000	0.4867	0.6024	3.3143	3.6011	7.2425	0.2599	0.2271	0.3550
Texas	1.0000	0.4963	0.6462	3.6373	3.4635	7.0829	0.2023	0.2581	0.3891
Utah	1.0000	0.4710	0.7295	3.2165	3.8439	9.7837	0.2773	0.2235	0.4385
Vermont	1.0000	0.2966	0.4488	3.1097	2.5556	6.3516	0.2963	0.1454	0.2732
Virginia	1.0000	0.3582	0.5705	3.3473	2.6930	6.7013	0.2540	0.1853	0.3681
Washington	1.0000	0.2971	0.4987	3.1437	2.3815	5.6182	0.2903	0.1682	0.3069
West Virginia	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Wisconsin	1.0000	0.4608	0.6226	2.8894	3.3055	7.7071	0.3356	0.2180	0.3622
Wyoming	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)

Appendix Table A-3. Multipliers for the Landscaping Services Sector

State	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
Alabama	1.000	0.247	0.939	36.6	3.7	12.3	0.665	0.159	0.567
Alaska	1.000	0.198	0.793	33.6	2.8	9.8	0.679	0.120	0.535
Arizona	1.000	0.233	1.135	30.3	3.1	13.6	0.695	0.150	0.701
Arkansas	1.000	0.212	0.839	35.3	3.4	11.7	0.671	0.122	0.486
California	1.000	0.273	1.414	27.2	3.1	14.3	0.710	0.175	0.887
Colorado	1.000	0.257	1.356	31.0	3.2	15.1	0.691	0.164	0.840
Connecticut	1.000	0.248	1.041	27.9	2.9	10.5	0.706	0.169	0.666
Delaware	1.000	0.200	0.820	33.3	2.8	9.7	0.681	0.124	0.486
Florida	1.000	0.272	1.299	30.0	3.7	15.4	0.696	0.182	0.804
Georgia	1.000	0.260	1.287	30.0	3.2	14.6	0.696	0.170	0.803
Hawaii	1.000	0.240	1.179	32.5	3.5	15.1	0.684	0.157	0.795
Idaho	1.000	0.240	0.950	34.8	4.0	13.9	0.674	0.152	0.579
Illinois	1.000	0.253	1.373	26.9	3.0	14.3	0.711	0.157	0.830
Indiana	1.000	0.229	1.002	32.9	3.4	12.3	0.682	0.134	0.578
Iowa	1.000	0.219	0.897	35.0	3.5	12.1	0.673	0.129	0.522
Kansas	1.000	0.238	1.029	33.3	3.5	13.2	0.681	0.140	0.601
Kentucky	1.000	0.225	0.846	34.7	3.6	10.9	0.674	0.136	0.498
Louisiana	1.000	0.257	0.936	39.2	4.1	12.7	0.652	0.152	0.564
Maine	1.000	0.207	0.921	35.3	3.4	13.1	0.671	0.129	0.562
Maryland	1.000	0.246	1.357	31.6	3.2	15.5	0.689	0.163	0.897
Massachusetts	1.000	0.251	1.173	28.6	3.1	12.0	0.703	0.163	0.741
Michigan	1.000	0.241	1.064	29.0	3.2	11.8	0.701	0.149	0.621
Minnesota	1.000	0.266	1.286	31.2	3.5	14.7	0.690	0.164	0.764
Mississippi	1.000	0.237	0.826	39.8	3.8	11.6	0.650	0.140	0.490
Missouri	1.000	0.273	1.182	35.1	3.9	14.6	0.672	0.167	0.704
Montana	1.000	0.205	0.816	43.3	3.6	12.2	0.633	0.117	0.489
Nebraska	1.000	0.232	1.016	36.6	3.9	13.7	0.665	0.140	0.602
Nevada	1.000	0.189	1.004	25.7	2.5	11.1	0.717	0.122	0.629
New Hampshire	1.000	0.250	1.054	32.3	3.5	12.4	0.685	0.157	0.628
New Jersey	1.000	0.266	1.033	28.9	2.9	10.1	0.702	0.174	0.653
New Mexico	1.000	0.242	0.956	36.2	3.9	13.6	0.667	0.147	0.601
New York	1.000	0.217	0.989	23.7	2.4	9.9	0.726	0.143	0.635
North Carolina	1.000	0.252	1.097	34.0	3.4	13.6	0.677	0.163	0.666
North Dakota	1.000	0.199	0.761	37.9	3.6	11.2	0.659	0.111	0.449
Ohio	1.000	0.251	0.954	32.7	3.6	11.5	0.683	0.150	0.560
Oklahoma	1.000	0.281	1.106	37.5	4.4	15.0	0.661	0.166	0.658
Oregon	1.000	0.282	1.104	30.1	4.1	13.9	0.696	0.178	0.677
Pennsylvania	1.000	0.259	1.222	28.9	3.3	13.5	0.701	0.161	0.736
Rhode Island	1.000	0.183	0.841	31.3	2.6	10.3	0.690	0.114	0.538
South Carolina	1.000	0.228	0.935	34.4	3.4	12.4	0.676	0.148	0.573
South Dakota	1.000	0.229	0.861	47.5	3.9	12.4	0.613	0.133	0.504
Tennessee	1.000	0.259	1.151	29.4	3.9	13.7	0.699	0.155	0.681
Texas	1.000	0.309	1.284	33.7	3.8	13.9	0.679	0.190	0.772
Utah	1.000	0.274	1.321	35.3	4.1	17.6	0.671	0.169	0.795
Vermont	1.000	0.222	0.911	35.4	3.5	12.9	0.670	0.139	0.560
Virginia	1.000	0.250	1.172	34.0	3.4	13.7	0.677	0.157	0.750
Washington	1.000	0.250	1.056	30.9	3.1	11.9	0.692	0.159	0.649
West Virginia	1.000	0.217	0.722	36.0	4.0	10.3	0.668	0.114	0.434
Wisconsin	1.000	0.228	1.023	30.0	3.4	12.8	0.696	0.137	0.598
Wyoming	1.000	0.214	0.721	39.3	3.6	10.3	0.652	0.123	0.440

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)

Appendix Table A-4. Multipliers for the Landscape Architecture Sector

	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
State	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
Alabama	1.000	0.152	0.952	12.1	2.4	12.4	0.746	0.101	0.571
Alaska	1.000	0.165	0.852	11.5	2.1	10.5	0.746	0.113	0.574
Arizona	1.000	0.213	1.178	12.0	2.8	14.0	0.746	0.146	0.722
Arkansas	1.000	0.134	0.863	16.2	2.3	12.0	0.746	0.087	0.497
California	1.000	0.239	1.427	10.1	2.6	14.3	0.746	0.165	0.891
Colorado	1.000	0.227	1.408	11.0	2.8	15.5	0.746	0.157	0.867
Connecticut	1.000	0.218	1.040	10.5	2.3	10.4	0.746	0.153	0.662
Delaware	1.000	0.137	0.839	9.2	1.7	9.8	0.746	0.093	0.491
Florida	1.000	0.227	1.321	13.3	3.1	15.6	0.746	0.157	0.813
Georgia	1.000	0.219	1.311	10.7	2.6	14.8	0.746	0.151	0.814
Hawaii	1.000	0.185	1.203	11.8	2.5	15.4	0.746	0.128	0.808
Idaho	1.000	0.174	0.973	13.7	2.9	14.1	0.746	0.117	0.590
Illinois	1.000	0.236	1.407	9.9	2.7	14.6	0.746	0.162	0.847
Indiana	1.000	0.162	1.025	13.7	2.3	12.5	0.746	0.108	0.587
Iowa	1.000	0.144	0.922	13.4	2.3	12.3	0.746	0.095	0.533
Kansas	1.000	0.167	1.051	12.0	2.4	13.4	0.746	0.112	0.610
Kentucky	1.000	0.151	0.870	13.5	2.4	11.1	0.746	0.102	0.509
Louisiana	1.000	0.183	1.001	11.9	2.8	13.5	0.746	0.124	0.599
Maine	1.000	0.146	0.952	13.6	2.3	13.4	0.746	0.097	0.575
Maryland	1.000	0.220	1.408	10.8	2.7	16.0	0.746	0.153	0.928
Massachusetts	1.000	0.228	1.202	9.2	2.4	12.2	0.746	0.159	0.756
Michigan	1.000	0.193	1.076	8.8	2.3	11.8	0.746	0.132	0.623
Minnesota	1.000	0.222	1.323	11.3	2.8	15.1	0.746	0.151	0.783
Mississippi	1.000	0.131	0.854	14.2	2.2	11.9	0.746	0.086	0.504
Missouri	1.000	0.196	1.215	11.4	2.7	15.0	0.746	0.133	0.720
Montana	1.000	0.142	0.900	15.6	2.5	13.4	0.746	0.094	0.535
Nebraska	1.000	0.175	1.068	13.7	2.8	14.3	0.746	0.117	0.628
Nevada	1.000	0.173	1.028	10.7	2.2	11.3	0.746	0.119	0.640
New Hampshire	1.000	0.181	1.066	12.6	2.3	12.4	0.746	0.124	0.630
New Jersey	1.000	0.227	1.035	9.4	2.4	10.1	0.746	0.159	0.651
New Mexico	1.000	0.190	1.004	13.3	3.1	14.2	0.746	0.128	0.628
New York	1.000	0.229	1.009	9.9	2.3	10.0	0.746	0.161	0.645
North Carolina	1.000	0.167	1.101	13.1	2.3	13.6	0.746	0.112	0.665
North Dakota	1.000	0.131	0.803	13.4	2.1	11.7	0.746	0.084	0.471
Ohio	1.000	0.197	0.988	12.3	2.8	11.8	0.746	0.134	0.577
Oklahoma	1.000	0.175	1.129	14.8	2.9	15.2	0.746	0.116	0.667
Oregon	1.000	0.210	1.107	12.5	3.0	13.8	0.746	0.144	0.675
Pennsylvania	1.000	0.225	1.253	10.2	2.6	13.8	0.746	0.154	0.752
Rhode Island	1.000	0.134	0.857	12.6	1.7	10.4	0.746	0.090	0.544
South Carolina	1.000	0.146	0.942	12.3	2.0	12.4	0.746	0.098	0.573
South Dakota	1.000	0.131	0.934	15.8	2.0	13.3	0.746	0.084	0.542
Tennessee	1.000	0.186	1.150	12.0	2.4	13.6	0.746	0.126	0.676
Texas	1.000	0.224	1.311	10.5	2.7	14.2	0.746	0.153	0.785
Utah	1.000	0.200	1.360	14.3	3.0	18.0	0.746	0.134	0.813
Vermont	1.000	0.167	0.941	15.1	2.5	13.2	0.746	0.112	0.573
Virginia	1.000	0.195	1.209	10.4	2.3	14.1	0.746	0.134	0.773
Washington	1.000	0.187	1.063	11.5	2.3	11.9	0.746	0.128	0.650
West Virginia	1.000	0.125	0.753	13.3	2.0	10.7	0.746	0.082	0.451
Wisconsin	1.000	0.182	1.042	12.9	2.6	12.9	0.746	0.122	0.605
Wyoming	1.000	0.154	0.777	15.1	2.4	11.0	0.746	0.103	0.471

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)

Appendix Table A-5. Multipliers for the Wholesale Flowers, Nursery Stock and Florist Supply, and Wholesale Equipment Distribution Sectors (Wholesale Trade)

	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
State	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
Alabama	1.000	0.213	0.953	8.6	2.7	13.2	0.666	0.127	0.602
Alaska	1.000	0.186	0.810	9.3	2.2	10.4	0.664	0.114	0.566
Arizona	1.000	0.267	1.171	7.2	2.9	15.1	0.671	0.171	0.760
Arkansas	1.000	0.207	0.844	9.3	2.7	12.5	0.664	0.120	0.511
California	1.000	0.311	1.411	6.9	2.9	14.9	0.672	0.200	0.914
Colorado	1.000	0.290	1.423	6.7	2.9	16.6	0.672	0.188	0.909
Connecticut	1.000	0.273	1.045	5.3	2.4	11.2	0.677	0.181	0.703
Delaware	1.000	0.180	0.845	6.6	1.9	10.8	0.673	0.112	0.536
Florida	1.000	0.289	1.314	7.5	3.2	16.4	0.670	0.187	0.841
Georgia	1.000	0.284	1.296	6.4	2.8	15.4	0.673	0.183	0.830
Hawaii	1.000	0.225	1.168	10.0	2.7	16.0	0.661	0.142	0.823
Idaho	1.000	0.233	0.931	9.6	3.3	14.4	0.663	0.143	0.594
Illinois	1.000	0.305	1.385	6.2	2.8	15.0	0.674	0.195	0.860
Indiana	1.000	0.233	1.029	8.0	2.7	13.2	0.668	0.140	0.618
Iowa	1.000	0.215	0.919	8.7	2.8	13.0	0.666	0.130	0.558
Kansas	1.000	0.236	1.050	8.0	2.8	14.4	0.668	0.143	0.636
Kentucky	1.000	0.200	0.818	8.2	2.5	11.0	0.667	0.121	0.498
Louisiana	1.000	0.226	0.999	8.9	2.9	14.6	0.665	0.137	0.634
Maine	1.000	0.191	0.944	8.9	2.5	14.3	0.665	0.117	0.612
Maryland	1.000	0.256	1.365	6.6	2.7	16.2	0.673	0.166	0.934
Massachusetts	1.000	0.281	1.172	5.6	2.5	12.5	0.676	0.185	0.770
Michigan	1.000	0.249	1.073	6.7	2.6	12.6	0.672	0.160	0.656
Minnesota	1.000	0.295	1.311	6.5	3.0	15.6	0.673	0.187	0.805
Mississippi	1.000	0.191	0.858	9.3	2.5	13.0	0.664	0.109	0.531
Missouri	1.000	0.284	1.210	7.6	3.2	15.7	0.669	0.180	0.744
Montana	1.000	0.173	0.840	10.6	2.6	13.3	0.659	0.101	0.526
Nebraska	1.000	0.238	1.077	8.4	3.1	15.4	0.667	0.146	0.664
Nevada	1.000	0.223	0.969	7.4	2.4	11.2	0.670	0.143	0.638
New Hampshire	1.000	0.231	1.070	5.9	2.5	13.7	0.675	0.147	0.670
New Jersey	1.000	0.287	1.034	5.7	2.5	10.8	0.676	0.187	0.687
New Mexico	1.000	0.236	1.020	10.7	3.2	15.4	0.659	0.142	0.679
New York	1.000	0.286	0.990	6.1	2.4	10.5	0.674	0.191	0.658
North Carolina	1.000	0.234	1.091	8.0	2.7	14.2	0.668	0.144	0.687
North Dakota	1.000	0.187	0.770	9.3	2.6	12.1	0.664	0.105	0.478
Ohio	1.000	0.235	0.921	7.6	2.8	11.6	0.669	0.145	0.562
Oklahoma	1.000	0.240	1.117	9.1	3.1	16.0	0.664	0.144	0.693
Oregon	1.000	0.281	1.040	7.2	3.2	13.7	0.671	0.179	0.664
Pennsylvania	1.000	0.292	1.202	7.3	2.9	13.8	0.670	0.183	0.746
Rhode Island	1.000	0.166	0.832	7.3	1.8	10.8	0.670	0.104	0.567
South Carolina	1.000	0.196	0.938	8.6	2.4	13.2	0.666	0.118	0.602
South Dakota	1.000	0.188	0.940	9.1	2.4	14.5	0.664	0.112	0.575
Tennessee	1.000	0.256	1.130	8.0	2.8	14.3	0.668	0.160	0.693
Texas	1.000	0.290	1.298	6.3	2.9	14.7	0.674	0.182	0.800
Utah	1.000	0.277	1.341	8.3	3.5	18.8	0.667	0.170	0.841
Vermont	1.000	0.217	0.942	8.5	2.8	14.2	0.666	0.134	0.614
Virginia	1.000	0.251	1.212	6.7	2.6	14.8	0.672	0.159	0.799
Washington	1.000	0.248	0.983	7.1	2.5	11.7	0.671	0.157	0.628
West Virginia	1.000	0.173	0.679	9.5	2.3	10.1	0.663	0.100	0.426
Wisconsin	1.000	0.243	1.031	8.0	2.9	13.5	0.668	0.149	0.631
Wyoming	1.000	0.188	0.754	8.9	2.5	11.9	0.665	0.111	0.492

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)

Appendix Table A-6. Multipliers for the Lawn and Garden Store and Building Materials & Supplies Sectors

	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
State	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
Alabama	1.000	0.214	0.943	17.0	2.6	12.8	0.674	0.128	0.586
Alaska	1.000	0.202	0.822	15.2	2.3	10.4	0.684	0.122	0.566
Arizona	1.000	0.268	1.167	15.8	2.9	14.6	0.680	0.173	0.743
Arkansas	1.000	0.218	0.845	18.8	2.7	12.2	0.664	0.129	0.503
California	1.000	0.298	1.414	14.5	2.7	14.7	0.687	0.193	0.905
Colorado	1.000	0.287	1.416	14.8	2.7	16.2	0.686	0.187	0.894
Connecticut	1.000	0.267	1.051	13.3	2.2	11.0	0.694	0.180	0.694
Delaware	1.000	0.194	0.847	15.0	2.0	10.5	0.685	0.121	0.524
Florida	1.000	0.289	1.311	15.8	3.1	16.0	0.680	0.187	0.828
Georgia	1.000	0.277	1.303	14.2	2.7	15.2	0.689	0.180	0.826
Hawaii	1.000	0.229	1.183	15.3	2.5	15.8	0.683	0.144	0.820
Idaho	1.000	0.225	0.950	14.8	3.0	14.4	0.686	0.138	0.595
Illinois	1.000	0.306	1.387	16.2	2.7	14.8	0.678	0.197	0.852
Indiana	1.000	0.245	1.030	16.8	2.7	13.0	0.675	0.149	0.609
Iowa	1.000	0.210	0.912	16.8	2.7	12.6	0.675	0.127	0.545
Kansas	1.000	0.247	1.045	17.5	2.8	14.0	0.671	0.149	0.624
Kentucky	1.000	0.207	0.830	16.9	2.5	11.0	0.674	0.126	0.499
Louisiana	1.000	0.235	0.985	17.3	2.9	14.0	0.672	0.142	0.613
Maine	1.000	0.187	0.934	16.9	2.5	13.8	0.675	0.115	0.592
Maryland	1.000	0.255	1.368	15.2	2.6	16.0	0.684	0.165	0.924
Massachusetts	1.000	0.271	1.182	13.4	2.4	12.4	0.693	0.179	0.765
Michigan	1.000	0.261	1.083	15.2	2.6	12.4	0.683	0.169	0.650
Minnesota	1.000	0.296	1.311	16.2	2.9	15.4	0.678	0.189	0.794
Mississippi	1.000	0.198	0.846	18.2	2.6	12.4	0.667	0.113	0.515
Missouri	1.000	0.288	1.218	16.3	3.2	15.5	0.677	0.183	0.739
Montana	1.000	0.174	0.841	18.1	2.5	13.0	0.668	0.101	0.518
Nebraska	1.000	0.242	1.057	18.1	3.0	14.8	0.667	0.149	0.641
Nevada	1.000	0.221	0.995	14.0	2.3	11.3	0.690	0.144	0.642
New Hampshire	1.000	0.231	1.073	13.8	2.5	13.3	0.691	0.148	0.660
New Jersey	1.000	0.278	1.040	13.6	2.4	10.6	0.692	0.183	0.678
New Mexico	1.000	0.238	1.002	17.3	3.2	14.9	0.672	0.142	0.654
New York	1.000	0.283	0.993	15.3	2.2	10.3	0.683	0.191	0.651
North Carolina	1.000	0.229	1.088	16.3	2.6	13.9	0.677	0.143	0.676
North Dakota	1.000	0.192	0.767	18.5	2.6	11.7	0.665	0.107	0.467
Ohio	1.000	0.265	0.952	16.7	2.9	11.8	0.675	0.165	0.572
Oklahoma	1.000	0.251	1.110	18.2	3.2	15.6	0.667	0.149	0.678
Oregon	1.000	0.280	1.060	16.1	3.2	13.7	0.679	0.179	0.665
Pennsylvania	1.000	0.297	1.212	16.8	2.9	13.8	0.675	0.187	0.744
Rhode Island	1.000	0.166	0.841	14.6	1.7	10.7	0.687	0.106	0.560
South Carolina	1.000	0.199	0.935	16.3	2.3	12.9	0.678	0.121	0.590
South Dakota	1.000	0.189	0.921	18.5	2.4	13.8	0.665	0.112	0.554
Tennessee	1.000	0.252	1.132	15.8	2.7	14.0	0.680	0.157	0.685
Texas	1.000	0.275	1.276	15.8	2.7	14.2	0.680	0.172	0.779
Utah	1.000	0.278	1.344	16.4	3.5	18.5	0.677	0.170	0.829
Vermont	1.000	0.221	0.939	16.1	2.8	13.8	0.678	0.136	0.599
Virginia	1.000	0.268	1.213	16.6	2.7	14.6	0.676	0.171	0.791
Washington	1.000	0.243	1.011	14.8	2.4	11.7	0.685	0.154	0.636
West Virginia	1.000	0.179	0.691	18.5	2.3	10.1	0.666	0.102	0.427
Wisconsin	1.000	0.246	1.033	16.2	2.8	13.3	0.678	0.152	0.621
Wyoming	1.000	0.196	0.745	17.7	2.5	11.3	0.670	0.115	0.475

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)

Appendix Table A-7. Multipliers for the Florist Sector (Miscellaneous Retail Stores)

	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
State	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
Alabama	1.000	0.397	0.746	23.9	4.9	10.0	0.395	0.238	0.460
Alaska	1.000	0.363	0.667	22.1	4.1	8.4	0.432	0.220	0.456
Arizona	1.000	0.445	1.038	20.2	4.8	12.9	0.469	0.286	0.656
Arkansas	1.000	0.413	0.652	25.5	5.2	9.3	0.363	0.244	0.385
California	1.000	0.489	1.301	19.4	4.4	13.4	0.486	0.317	0.828
Colorado	1.000	0.527	1.241	22.5	5.0	14.1	0.423	0.343	0.779
Connecticut	1.000	0.477	0.937	21.0	4.0	9.7	0.454	0.320	0.612
Delaware	1.000	0.350	0.683	22.2	3.6	8.4	0.429	0.219	0.418
Florida	1.000	0.483	1.177	20.4	5.2	14.3	0.466	0.313	0.739
Georgia	1.000	0.477	1.169	20.4	4.6	13.5	0.466	0.309	0.738
Hawaii	1.000	0.391	1.010	20.8	4.3	13.4	0.458	0.246	0.694
Idaho	1.000	0.447	0.753	24.8	6.0	11.3	0.377	0.274	0.468
Illinois	1.000	0.534	1.248	21.7	4.8	13.2	0.439	0.344	0.763
Indiana	1.000	0.462	0.836	24.4	5.2	10.5	0.386	0.282	0.491
Iowa	1.000	0.399	0.715	24.5	5.1	9.8	0.383	0.241	0.424
Kansas	1.000	0.461	0.848	24.4	5.2	11.2	0.385	0.279	0.503
Kentucky	1.000	0.376	0.672	23.3	4.6	8.8	0.408	0.229	0.402
Louisiana	1.000	0.409	0.818	22.2	5.1	11.5	0.429	0.247	0.505
Maine	1.000	0.354	0.712	24.5	4.7	10.4	0.384	0.217	0.447
Maryland	1.000	0.433	1.202	20.5	4.4	13.9	0.463	0.279	0.807
Massachusetts	1.000	0.445	1.082	18.9	3.9	11.3	0.496	0.294	0.696
Michigan	1.000	0.458	0.947	21.5	4.6	10.8	0.443	0.297	0.565
Minnesota	1.000	0.537	1.152	22.9	5.3	13.4	0.416	0.343	0.694
Mississippi	1.000	0.348	0.670	22.9	4.5	9.7	0.414	0.200	0.405
Missouri	1.000	0.543	1.045	24.1	6.0	13.2	0.391	0.346	0.630
Montana	1.000	0.325	0.627	24.7	4.6	9.6	0.380	0.187	0.383
Nebraska	1.000	0.436	0.867	23.6	5.5	12.0	0.402	0.267	0.522
Nevada	1.000	0.388	0.849	20.9	4.0	9.6	0.455	0.253	0.544
New Hampshire	1.000	0.421	0.905	21.8	4.5	11.1	0.438	0.269	0.552
New Jersey	1.000	0.468	0.951	19.5	4.0	9.6	0.482	0.308	0.614
New Mexico	1.000	0.404	0.843	21.5	5.4	12.3	0.444	0.241	0.543
New York	1.000	0.459	0.919	19.3	3.5	9.4	0.486	0.310	0.599
North Carolina	1.000	0.393	0.925	21.3	4.4	11.7	0.447	0.245	0.572
North Dakota	1.000	0.348	0.594	24.0	4.7	9.0	0.394	0.194	0.358
Ohio	1.000	0.446	0.841	21.0	4.9	10.3	0.453	0.279	0.502
Oklahoma	1.000	0.469	0.894	24.8	5.9	12.4	0.378	0.278	0.541
Oregon	1.000	0.511	0.927	23.0	5.8	11.8	0.414	0.326	0.578
Pennsylvania	1.000	0.539	1.062	23.3	5.2	12.0	0.408	0.341	0.647
Rhode Island	1.000	0.310	0.653	23.0	3.3	8.2	0.414	0.198	0.430
South Carolina	1.000	0.348	0.761	21.9	4.1	10.4	0.435	0.213	0.477
South Dakota	1.000	0.340	0.713	23.8	4.3	10.6	0.397	0.202	0.426
Tennessee	1.000	0.452	0.962	22.4	4.9	11.7	0.426	0.281	0.578
Texas	1.000	0.488	1.112	22.0	4.7	12.3	0.433	0.305	0.676
Utah	1.000	0.495	1.159	22.5	6.2	15.8	0.424	0.304	0.710
Vermont	1.000	0.408	0.757	23.4	5.2	11.0	0.406	0.251	0.478
Virginia	1.000	0.487	1.036	23.1	5.0	12.4	0.411	0.310	0.671
Washington	1.000	0.438	0.870	22.1	4.4	10.0	0.432	0.278	0.543
West Virginia	1.000	0.341	0.513	25.5	4.4	7.5	0.363	0.194	0.314
Wisconsin	1.000	0.465	0.846	24.1	5.3	10.8	0.391	0.287	0.505
Wyoming	1.000	0.368	0.565	24.7	4.8	8.5	0.379	0.216	0.356

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)

Appendix Table A-8. Multipliers for the Food and Beverage Stores Sector

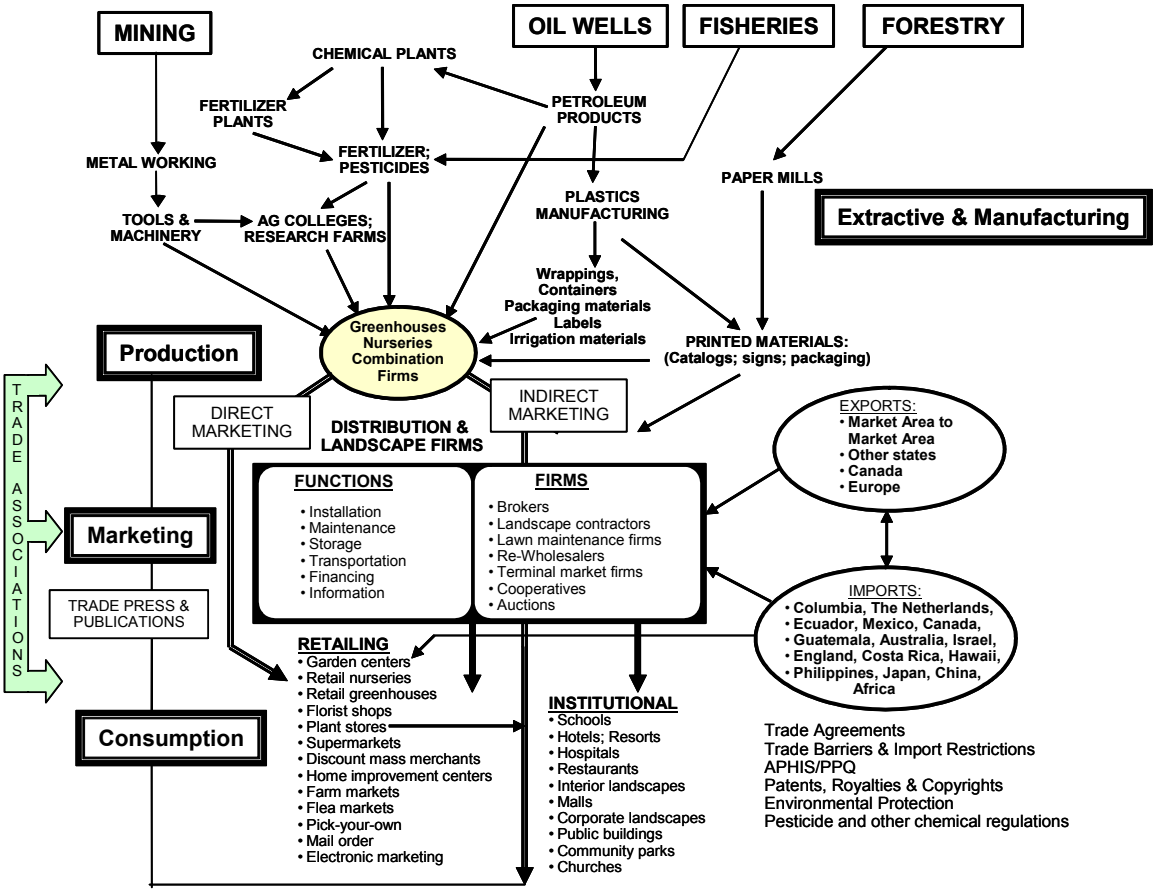
State	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
	Direct Effects	Indirect Effects	Induced Effects	Direct Effects	Indirect Effects	Induced Effects	Direct Effects	Indirect Effects	Induced Effects
Alabama	1.000	0.286	0.870	21.5	3.5	11.8	0.564	0.171	0.539
Alaska	1.000	0.249	0.777	17.5	2.8	9.8	0.610	0.151	0.534
Arizona	1.000	0.325	1.131	17.3	3.5	14.1	0.612	0.209	0.718
Arkansas	1.000	0.296	0.773	23.3	3.7	11.1	0.544	0.175	0.459
California	1.000	0.350	1.393	15.6	3.2	14.4	0.632	0.227	0.890
Colorado	1.000	0.346	1.379	16.6	3.3	15.7	0.621	0.225	0.869
Connecticut	1.000	0.345	1.016	18.0	2.9	10.6	0.604	0.232	0.668
Delaware	1.000	0.261	0.781	20.6	2.7	9.6	0.575	0.163	0.481
Florida	1.000	0.405	1.232	22.5	4.3	15.0	0.553	0.262	0.776
Georgia	1.000	0.384	1.233	21.1	3.7	14.4	0.569	0.249	0.780
Hawaii	1.000	0.299	1.112	19.6	3.3	14.8	0.586	0.188	0.768
Idaho	1.000	0.290	0.900	18.8	3.9	13.6	0.596	0.177	0.563
Illinois	1.000	0.398	1.338	20.0	3.6	14.2	0.582	0.256	0.820
Indiana	1.000	0.329	0.961	21.7	3.7	12.1	0.562	0.201	0.567
Iowa	1.000	0.293	0.829	23.0	3.7	11.5	0.547	0.177	0.494
Kansas	1.000	0.331	0.975	22.0	3.8	13.0	0.558	0.200	0.581
Kentucky	1.000	0.287	0.760	22.8	3.5	10.0	0.549	0.174	0.455
Louisiana	1.000	0.318	0.911	22.1	4.0	12.9	0.557	0.192	0.564
Maine	1.000	0.250	0.855	21.4	3.3	12.6	0.565	0.153	0.540
Maryland	1.000	0.319	1.314	18.0	3.3	15.3	0.604	0.206	0.885
Massachusetts	1.000	0.370	1.126	20.0	3.2	11.8	0.581	0.244	0.726
Michigan	1.000	0.350	1.026	20.6	3.5	11.7	0.575	0.227	0.614
Minnesota	1.000	0.376	1.268	19.2	3.8	14.8	0.590	0.241	0.767
Mississippi	1.000	0.267	0.769	22.7	3.5	11.2	0.551	0.153	0.466
Missouri	1.000	0.391	1.153	21.7	4.3	14.6	0.562	0.249	0.698
Montana	1.000	0.228	0.769	21.4	3.2	11.9	0.565	0.132	0.472
Nebraska	1.000	0.332	0.973	23.3	4.2	13.5	0.544	0.204	0.588
Nevada	1.000	0.269	0.955	16.5	2.8	10.8	0.622	0.175	0.615
New Hampshire	1.000	0.331	0.988	22.0	3.5	12.2	0.559	0.211	0.605
New Jersey	1.000	0.361	1.007	18.3	3.1	10.2	0.601	0.237	0.654
New Mexico	1.000	0.301	0.945	19.7	4.0	13.9	0.585	0.179	0.613
New York	1.000	0.380	0.954	20.6	2.9	9.8	0.575	0.257	0.624
North Carolina	1.000	0.318	1.002	22.5	3.6	12.8	0.553	0.198	0.621
North Dakota	1.000	0.278	0.674	25.8	3.8	10.2	0.516	0.155	0.408
Ohio	1.000	0.353	0.901	21.3	3.9	11.1	0.567	0.221	0.540
Oklahoma	1.000	0.330	1.039	21.8	4.2	14.5	0.561	0.196	0.632
Oregon	1.000	0.359	1.023	19.4	4.1	13.1	0.589	0.229	0.641
Pennsylvania	1.000	0.390	1.161	20.8	3.7	13.1	0.572	0.246	0.710
Rhode Island	1.000	0.229	0.763	21.2	2.4	9.6	0.568	0.146	0.506
South Carolina	1.000	0.264	0.863	20.9	3.1	11.8	0.572	0.161	0.543
South Dakota	1.000	0.269	0.813	25.2	3.4	12.1	0.522	0.160	0.487
Tennessee	1.000	0.333	1.070	20.4	3.6	13.2	0.577	0.207	0.645
Texas	1.000	0.359	1.217	19.9	3.5	13.5	0.582	0.225	0.741
Utah	1.000	0.370	1.270	21.1	4.6	17.4	0.569	0.227	0.781
Vermont	1.000	0.293	0.874	20.7	3.7	12.8	0.573	0.180	0.556
Virginia	1.000	0.355	1.148	20.9	3.6	13.8	0.571	0.226	0.746
Washington	1.000	0.296	0.984	16.9	2.9	11.4	0.617	0.188	0.617
West Virginia	1.000	0.241	0.628	22.9	3.1	9.2	0.549	0.137	0.386
Wisconsin	1.000	0.348	0.950	23.3	4.0	12.2	0.544	0.215	0.569
Wyoming	1.000	0.259	0.680	21.6	3.3	10.3	0.563	0.152	0.432

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)

Appendix Table A-9. Multipliers for the General Merchandise Stores Sector

State	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
Alabama	1.000	0.211	0.945	24.7	2.6	12.8	0.678	0.127	0.585
Alaska	1.000	0.195	0.824	21.2	2.2	10.4	0.695	0.118	0.567
Arizona	1.000	0.270	1.163	24.7	2.9	14.5	0.678	0.174	0.738
Arkansas	1.000	0.220	0.842	28.2	2.8	12.2	0.662	0.130	0.500
California	1.000	0.299	1.413	23.1	2.7	14.6	0.686	0.194	0.902
Colorado	1.000	0.293	1.407	24.4	2.8	16.0	0.679	0.191	0.886
Connecticut	1.000	0.276	1.046	23.5	2.3	10.9	0.684	0.185	0.687
Delaware	1.000	0.201	0.835	26.0	2.1	10.3	0.672	0.126	0.514
Florida	1.000	0.292	1.306	24.9	3.1	15.9	0.677	0.189	0.823
Georgia	1.000	0.289	1.293	25.2	2.8	15.1	0.676	0.187	0.818
Hawaii	1.000	0.223	1.188	22.0	2.4	15.8	0.691	0.140	0.820
Idaho	1.000	0.232	0.944	25.0	3.1	14.2	0.677	0.142	0.590
Illinois	1.000	0.316	1.381	26.7	2.8	14.6	0.669	0.203	0.847
Indiana	1.000	0.257	1.017	28.8	2.9	12.8	0.659	0.157	0.599
Iowa	1.000	0.219	0.899	28.4	2.8	12.4	0.661	0.133	0.536
Kansas	1.000	0.247	1.043	26.5	2.8	13.9	0.670	0.150	0.621
Kentucky	1.000	0.210	0.829	26.5	2.6	10.9	0.669	0.128	0.497
Louisiana	1.000	0.241	0.974	27.8	3.0	13.8	0.663	0.146	0.603
Maine	1.000	0.193	0.924	27.4	2.6	13.6	0.665	0.118	0.583
Maryland	1.000	0.263	1.359	25.7	2.7	15.8	0.673	0.170	0.915
Massachusetts	1.000	0.277	1.179	23.0	2.4	12.3	0.687	0.183	0.761
Michigan	1.000	0.274	1.071	27.0	2.8	12.2	0.667	0.178	0.641
Minnesota	1.000	0.299	1.308	25.6	3.0	15.3	0.674	0.191	0.791
Mississippi	1.000	0.201	0.839	28.0	2.6	12.3	0.663	0.115	0.509
Missouri	1.000	0.293	1.214	26.1	3.2	15.4	0.671	0.187	0.735
Montana	1.000	0.175	0.839	27.3	2.5	12.9	0.666	0.101	0.515
Nebraska	1.000	0.252	1.043	29.9	3.2	14.5	0.654	0.155	0.631
Nevada	1.000	0.221	0.995	22.2	2.3	11.3	0.690	0.144	0.640
New Hampshire	1.000	0.242	1.061	25.0	2.6	13.1	0.677	0.154	0.649
New Jersey	1.000	0.280	1.040	22.1	2.4	10.6	0.691	0.184	0.675
New Mexico	1.000	0.239	0.996	26.2	3.2	14.7	0.671	0.142	0.646
New York	1.000	0.285	0.993	24.2	2.2	10.2	0.681	0.193	0.649
North Carolina	1.000	0.233	1.085	25.8	2.6	13.8	0.673	0.145	0.672
North Dakota	1.000	0.200	0.757	30.2	2.7	11.5	0.652	0.111	0.459
Ohio	1.000	0.269	0.951	26.3	3.0	11.7	0.671	0.168	0.570
Oklahoma	1.000	0.240	1.122	24.2	3.0	15.7	0.681	0.143	0.682
Oregon	1.000	0.274	1.067	23.1	3.1	13.7	0.686	0.175	0.668
Pennsylvania	1.000	0.301	1.210	26.6	2.9	13.7	0.669	0.190	0.741
Rhode Island	1.000	0.171	0.834	24.9	1.8	10.5	0.677	0.109	0.552
South Carolina	1.000	0.206	0.924	27.3	2.4	12.6	0.666	0.126	0.581
South Dakota	1.000	0.195	0.910	29.8	2.5	13.6	0.654	0.116	0.545
Tennessee	1.000	0.250	1.134	23.9	2.7	13.9	0.682	0.156	0.684
Texas	1.000	0.269	1.279	22.9	2.6	14.2	0.687	0.168	0.779
Utah	1.000	0.283	1.337	26.4	3.5	18.3	0.670	0.174	0.822
Vermont	1.000	0.226	0.932	26.1	2.8	13.7	0.672	0.139	0.592
Virginia	1.000	0.272	1.208	26.1	2.8	14.5	0.672	0.173	0.786
Washington	1.000	0.238	1.020	21.9	2.4	11.8	0.691	0.151	0.640
West Virginia	1.000	0.181	0.691	28.3	2.4	10.1	0.661	0.103	0.425
Wisconsin	1.000	0.260	1.018	28.8	3.0	13.0	0.659	0.161	0.610
Wyoming	1.000	0.201	0.735	28.3	2.6	11.1	0.661	0.118	0.466

Source: *Implan* 50 state data package, 2001 (MIG, Inc. 2004)



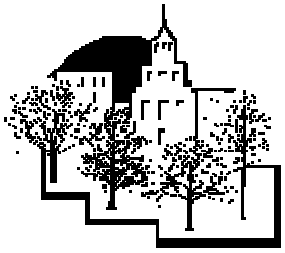
Appendix Figure A-1. Detailed Structure of the Green Industry in the United States

Nursery & Landscape Association Executives of North America

ANLA

PLANET
Professional Landcare Network

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE



The National Urban and Community Forestry Advisory Council

www.utextension.utk.edu/hbin/greenimpact.html