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FE632

Economic Impacts of the Turfgrass and Lawncare Industry in the United States

John J. Haydu, PhD, Professor, UF/IFAS Mid-Florida Research and Education Center 2725 Binion Rd., Apopka, Florida 32703; email jjh@ifas.ufl.edu
Alan W. Hodges, PhD, Associate, UF/IFAS Food & Resource Economics Department PO Box 110240, Gainesville, Florida 32611; email awhodges@ufl.edu
Charles R. Hall, PhD, Professor, University of Tennessee, Department of Agricultural Economics 2621 Morgan Circle, Room 314B, Knoxville, Tennessee 37996; email crh@utk.edu

EXECUTIVE SUMMARY

The turfgrass and lawncare industry in the United States continues to grow rapidly due to strong demand for residential and commercial property development, rising affluence, and the environmental and aesthetic benefits of turfgrass in the urban landscape. Economic sectors of the industry include sod farms, lawncare services, lawn and garden retail stores, and lawn equipment manufacturing. Golf courses were included in this study as a major industry that depends upon highly managed turfgrass for golf play. Numerous studies have been conducted on the economic impacts of the turfgrass and lawncare industry for individual states or regions; however, this research is the first to report results for the entire United States.

Economic impacts of the U.S. turfgrass and lawncare industry in 2002 were estimated based upon survey data in conjunction with various published sources of secondary data, and economic multipliers derived from regional input-output models for each state using the *Implan* software system and associated datasets. Information gathered for each sector included number of establishments, employment, payroll, and sales receipts. Sources included the 2002 Census of Agriculture (sod farms), the 2002 Economic Census Industry Report Series, and County Business Patterns (U.S. Commerce Department).

As defined in this study, the five sectors comprising the U.S. turfgrass industry in 2002 generated total output (revenue) impacts of $57.9 billion (Bn), employment impacts of 822,849 jobs, value added impacts of $35.1 Bn, labor income of $23.0 Bn, and $2.4 Bn in indirect business taxes to local and state governments. If these values are expressed in 2005 dollars, the total output impact was $62.2 Bn and the total value added impact was $37.7 Bn. The value added impact represents total personal and business net income.

Among individual sectors, sod producers created nearly $1.8 Bn in output impacts, $1.3 Bn in value added, and 17,028 jobs. Lawn equipment manufacturers contributed $8.0 Bn in output, $2.5 Bn in value added, and supported nearly 34,000 jobs. The lawncare goods retailing sector produced $9.1 Bn in output impacts, contributed $5.8 Bn in value added, and sustained 114,294 jobs. The lawncare services sector generated nearly $19.8 Bn in output impacts, $13.3 Bn in value added, and 295,841 jobs. Golf courses had $23.3 Bn in output impacts, $14.5 Bn in value added, and 361,690 jobs.

Economic impacts were summarized for individual states and seven geographic regions of the United States, with the turfgrass and lawncare industry having significant activity in all areas of the United States. The top ten individual states in terms of employment impacts were California (101,022 jobs), Florida (83,944), Texas (52,784), Ohio (33,154), Illinois (31,625), Pennsylvania (30,845), North Carolina (28,860), Georgia (27,327), South Carolina (25,083), and New York (23,965). Regionally, the Southeast was the largest in terms of employment impacts (197,711 jobs), followed by the East-Central (159,358), Western Coastal (130,862), South-Central (112,284), North-Central (100,738), Western-Interior (64,226), and Northeast (57,671).

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Acknowledgements

This study was sponsored in part by the International Turfgrass Research Foundation, Turfgrass Producers International, Rolling Meadows, IL

This document is FE632, one of a series of the Food and Resource Economics Department, UF/IFAS Extension. Original publication date March 2006. Reviewed October 2015. Visit the EDIS website at http://edis.ifas.ufl.edu.

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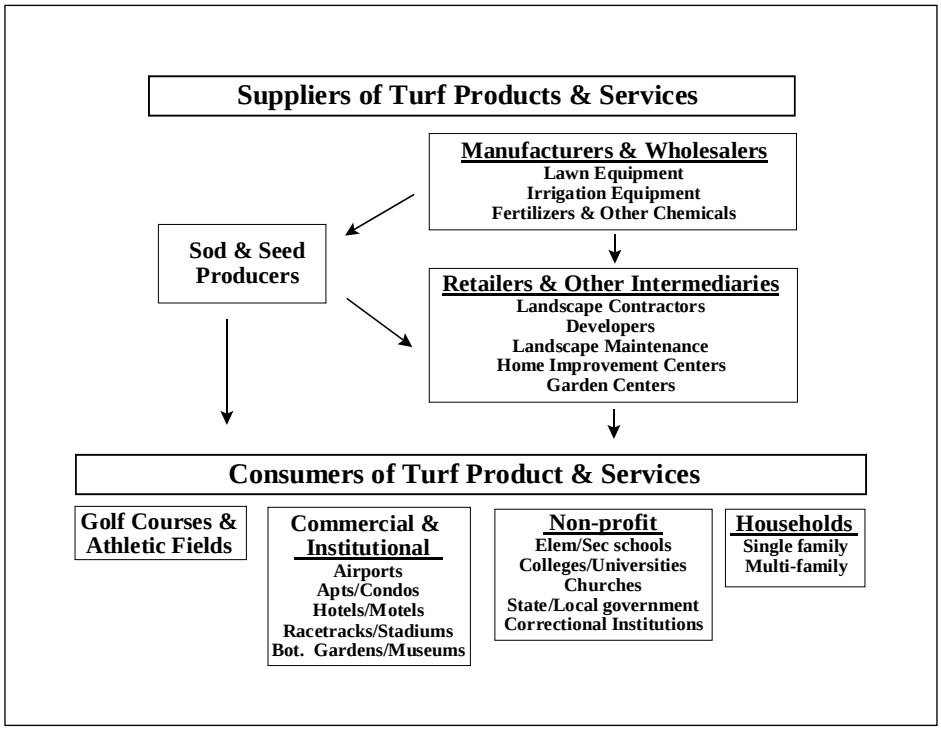
INTRODUCTION

Cultivated turfgrass is a pervasive feature of the urban landscape in the United States and many other developed regions of the world. According to Beard (1973), turfgrass provides at least three major benefits to human activities: functional, recreational, and ornamental. *Functional* uses include wind and water erosion control, thereby reducing dust and mud problems surrounding homes and businesses. Metropolitan areas and suburban residences profit from the cool, green pleasant environment afforded from healthy lawns, with landscapes frequently complemented by numerous trees, flowers and shrubs. Turf is also recognized for reducing glare, noise, air pollution and heat buildup. Turf is used extensively along roadsides for erosion control and as a stabilized zone for emergency stopping and repairs. *Recreational* use of turf is extensive throughout the world. Common sports activities played on turf include golf, lawn tennis, soccer, rugby, polo, and football. Most professional and recreational sports utilize grass surfaces because of its ability to minimize injuries (compared to hard surfaces) and provide a durable groundcover capable of cost-effective regeneration from season to season. *Ornamental* or aesthetic attributes of turfgrass are also highly regarded. Properly landscaped homes and businesses may also benefit financially from higher resale values when compared to poorly landscaped residences (Behe, et al, 2005; Des Rosiers, et al, 2002; Henry, 1999; Orland, et al, 1992).

Structure of the Turfgrass Industry

In the United States, a very large industry has rapidly evolved to produce and deliver turfgrass products and services. This industry contributes to the national economy in terms of employment, spending on inputs, income from sales of turfgrass products and services, as well as business taxes generated by its economic activities. Economic activity in the turfgrass industry may be broadly grouped into two categories: 1) production and supply of turfgrass products and related services and 2) intermediate and final consumption of turf products and services. The supply of turfgrass products includes not only grass but also the many goods necessary for production and maintenance, such as chemicals, fertilizer and lawn equipment. Turfgrass service activities include landscape planning and design, landscape installation and the ongoing maintenance of turfgrass areas. Consumption of turfgrass products and services may be subdivided as (a) integral turf-based activities, such as golf courses or athletic fields, which rely heavily on turfgrass as a major driver of their business and (b) ancillary uses, such as lawns surrounding homes, businesses, and public roads and highways.

Figure 1. Market structure of the turfgrass industry.



The structure of the turfgrass industry and the flow of goods and services among the various sectors of the industry are shown in Figure 1. Central to this economic activity are the sod growers who create the product that is directly or indirectly utilized by the rest of the industry. Manufacturers of turf equipment, fertilizers and chemicals hold a similar economic role as primary producers. Wholesalers, retailers, and service vendors purchase and resell sod and other turfgrass products together with their related services to consumers. These market intermediaries provide value-added services to customers including transportation, packaging, installation, and product use information. In addition, lawn

maintenance service vendors provide complete lawn care services, such as mowing, pest and disease control, irrigation and fertilization. Each of these service activities adds value to turfgrass products for final consumers.

The purpose of this study was to document the size, scope and structure of the turfgrass industry and to assess its economic contribution to the United States economy. Input-output (IO) models were employed to generate multipliers that account for the full range of economic activity between industry sectors within each state. I-O models capture what each business or sector must purchase from every other sector to produce its products and services. Variables examined in this analysis include output or total sales impacts, employment (jobs generated), value added (net income after direct costs are subtracted from gross output), labor income, and indirect business taxes. Total impacts include the *direct* effects, which are changes in economic activity resulting from the sale of a product or service to intermediate or final consumers; *indirect* effects of economic activity arising from purchases of inputs by the directly affected sectors; and *induced* effects from household spending as a result of income earned by industry employee. As an example of indirect impacts, sod sales by a producer results in purchases of inputs such as seeds, fertilizer, and chemicals as he replants his harvested fields.

Previous Economic Studies of the Turfgrass Industry

For many decades the U.S. Department of Agriculture has collected detailed production and financial data on the farm sector. This information has been used by government agencies, universities, and trade associations to track changes in the size and scope of the various agricultural industries over time. However, not all sectors of agriculture were included in the government's early data collection effort. Typically, those sectors incorporated were limited to large-scale "food & fiber" commodities, such as corn, soybeans, cotton, citrus, dairy, and cattle. This decision to focus on the largest, most common sectors of agriculture was largely cost driven — it was simply too expensive for the government to collect detailed information on the many hundreds of relatively minor "specialty crops" that were produced in this country. In the past 20 years, the economic significance of specialty crops has grown appreciably and, as a consequence, the USDA now conducts broader studies that include nearly all specialty crops. Additional studies have been conducted that focus on ornamental crops and turfgrass, such as "Floriculture and Nursery Crops Outlook" (USDA/ERS, 2005). While these studies have filled a void in government statistics for "green industry" crops, due to the large numbers of specialty crops produced and the number of states producing them, information collected is for the most part limited to area under production (acres or square feet).

Since the early 1970s the economic importance of the green industry has grown substantially, making it the second most important sector in agriculture (USDA/NASS, 2004). This development was spurred primarily by rapid population growth and rising household incomes that began in the early 1990s and continues today. With an expanding economy, more disposable income, and extremely low interest rates, the demand for new home construction rose markedly as well. A strong upturn in the construction of homes, commercial businesses and schools translated into a similarly strong upturn in the demand for landscape materials, including turfgrass. This in turn prompted the green industry to ratchet up supply of products and services, hence the remarkable growth of this industry.

The downside to urban population growth and green industry expansion is the pressure it places on scarce resources, particularly land and water. Competition for these resources is felt in many parts of the country, but is particularly acute in densely populated areas (Carriker, 1993; Campbell & Sargent, 2001; Haydu et al, 2004). As industries struggle for access to more water and land, the incentives to document their economic contributions to society have grown. As a result, a recent abundance of "green industry" studies funded largely by state trade associations and conducted by University economists and horticulturists have been published. The scope of industry publications and the methodologies employed vary widely, but all have a common theme and purpose of documenting the economic contribution of their respective industries. A list of over 50 of these state-level publications spanning the period 1978 to 2004 is presented in Table 1. The titles of these studies can be grouped into three categories: 1) studies that have general titles such as "Green Industry Survey", "Environmental Horticulture" or "Nursery Industry", most of which also cover the turfgrass industry as well; 2) studies with titles that identify both nursery and turfgrass explicitly; and 3) studies with turfgrass titles only.

The present study extends findings from a previous study by the same authors (Hall, Hodges and Haydu, 2005) which estimated economic impacts for the Green Industry in the United States, of which turfgrass-related activity is an important component.

Table 1. Previous economic impact studies of the turfgrass industry in individual states, 1978–2004.

Year Reported	State Scope	
2004	Wisconsin	Green Industry Survey
2004	New England	Environmental Horticulture
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
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	Louisiana	Nursery and Turfgrass Industry
1996	Maryland	Turfgrass Industry
1996	Mississippi	Turfgrass 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
1991	Florida	Turfgrass 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

Source: Hall, Hodges and Haydu, 2005.

RESEARCH METHODOLOGY

Industry Sectors

The economic sectors associated with the turfgrass and lawncare industry in the United States include sod farms, lawncare services, lawn and garden retail stores, lawn equipment manufacturing, and golf courses, as indicated in Table 2. Definitions of these sectors were based on the North American Industry Classification System (NAICS, Executive Office of the President, Office of Management and Budget), at the five or six-digit level of detail. The five sectors shown in Table 2 are major components of the turfgrass industry that were used in estimating economic impacts. However, it should be noted that they do not represent all the sectors that contribute to the value of the turf industry. There are other turf-based recreational activities, such as racetracks and athletic fields, which were not included in the analysis due to a lack of data to estimate their economic impact. Consequently, the impact values presented in this report for the turfgrass industry are considered a conservative estimate of the true value. In the same vein, it is also important to recognize that this study includes golf courses as part of the turfgrass industry's economic impact. Although it is logical to do so since turfgrass is a key input in golf operations, other aspects of golf operations are less directly attributable to turfgrass, such as restaurants or lodging establishments. In these activities, the economic role of turfgrass may be less clear and less significant. This qualifier is important given the economic significance of this particular sector.

Table 2. Classification of sectors associated with the turfgrass and lawncare industry**.**

Sector	Industry Sector(s) (NAICS code)	*Implan* Sector Name (Number)
Sod Farms	Nursery and Floriculture Production (11142)*	Nursery & Greenhouse (6)
Lawncare Services	Landscaping Services (56173)*	Services To Buildings And Dwellings (458)
Lawncare Retail Stores	Lawn and Garden Equipment and Supplies Stores (4442)* and Home Centers (44411)*	Building Material And Garden Supply Stores (404)
Lawn Equipment Manufacturing	Lawn & Garden Tractor and Home Lawn and Garden Equipment Manufacturing (333112)*	Lawn & Garden Equipment Manufacturing (258)
Golf Courses	Golf Courses and Country Clubs (71391)	Amusement, Gambling and Recreation Services (458)

* Turfgrass-related activity in this sector is a portion of the overall industry sector.

Information Sources

Economic information on the turfgrass industry was compiled from a variety of sources. 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 sod farms, national and state information on number of farms and production area were taken from the Census of Agriculture for 2002. Area and value of turfgrass harvested were estimated from industry survey data, with harvest value based on regional average prices. In this survey, a total of 581 sod farms were sent questionnaires of which 159 were returned, for a response rate of 27 percent. To determine value, respondents were asked their production area, percent of area harvested, average price (farm gate price, i.e., delivery not included), and share of total sales as sod products, and the share of sales that to customers outside their state.

For the sectors of lawncare services, retailing, equipment manufacturing and golf courses, information on number of establishments, employment, and sales (receipts) were taken from the 2002 Economic Census Industry Report Series for U.S. totals (U.S. Census Bureau, 2005). State-level information on number of firms, employment and payroll were taken from County Business Patterns (U.S. Department of Commerce), and were adjusted to match the U.S. totals. 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.

Information on specific lawncare-related landscape services was taken from Dun & Bradstreet (Dun and Bradstreet Information Systems, 1997). A total of 18 specialty sectors were delineated representing over 53

thousand establishments nationwide. For the activities of lawn and garden services, garden maintenance and planting services, and landscape contractors, the share of total revenues that were turfgrass-related was estimated at 29.5 percent, based on data from the Economic Census. Retail sales of lawncare goods were taken from the National Gardening Survey for 2002, which was conducted by Harris Interactive for the National Gardening Association (Butterfield, 2005). Sales of lawncare goods amounted to $11.96 Bn in 2002, which represented 30.2 percent of total U.S. household retail lawn and garden expenditures ($39.64 Bn). Information on manufacturing of specific lawn equipment was taken from the *Current Industrial Report on Farm Machinery and Lawn and Garden Equipment Manufacturing* (U.S. Census Bureau, 2003b). Lawn equipment was segregated into six different categories, accounting for a total of $6.15 billion in sales in 2003.

Economic Impact Analysis

To evaluate the broad regional economic impacts of the turfgrass and lawncare 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 *Implan* data used for this analysis was based on fiscal year 2001. 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 and Blair, 1985).

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 sectors used in the *Implan* models are indicated in Table 2 and the multipliers for each industry sector and state are shown in Appendix A. 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. 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, manufacturer, service, and golf course sectors, total economic impacts were estimated as:

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

while impacts for the retail trade sectors 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 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 a national nursery industry survey

(Brooker, et al, 2005). The calculation for the retail lawn and garden store sector assumed output is reduced to reflect only the gross margin on sales (29.5 percent) according to national averages (U.S. Census Bureau, 2004b). In some cases, impact results for 2002 values were restated 7.36 percent higher to express in current dollars terms, using the Gross Domestic Product (GDP) Implicit Price Deflator (U.S. Dept. Commerce, 2005) for April 2002 and April 2005.

RESULTS

National Results for All Industry Sectors

Total economic impacts of the five major sectors of the turfgrass industry in 2002 are summarized in Table 3. Total output or revenue impacts were estimated at $57.94 billion (Bn). Total value added or net income impacts were $35.07 Bn, including labor (earned) income of $23.04 Bn. Whereas "total output impacts" is a gross figure, value added is a "net" estimate in that it basically subtracts out the Cost of Goods Sold (COGS) from gross output. Total employment impacts were 822,848 jobs, including both fulltime and part-time positions. Economic activity in the turfgrass industry also remunerated $2.42 Bn in indirect business taxes to local and state governments. When these impact estimates for 2002 are adjusted for inflation to express in 2005 dollars, the total output impact is $62.20 Bn, the total value added impact is $37.65 Bn, the total labor income impact is $24.73 Bn, and the indirect business tax impact is $2.60 Bn. Other results in this report may be adjusted for inflation by multiplying 2002-dollar values by 1.0736.

Table 3. Summary of economic impacts of the turfgrass and lawncare industry in the United States, by sector, 2002.

Sector	Output				Value Added (Mn$)	Labor Income (Mn$)	Indirect Business Tax (Mn$)	Employ-ment (jobs)
	Total (Mn$)	Direct (Mn$)	Indirect (Mn$)	Induced (Mn$)				
Sod Production	1,669.6	1,494.5	28.9	14 6.2	1,266.3	58 5.8	27.2	17,028
Lawncare Services	18,506.9	12,811.5	1,013.4	4, 681.9	12,425.1	9, 684.5	458.4	295,841
Lawncare Retailing	8,473.7	3,529.1	922.9	4, 021.8	5, 483.1	3, 615.3	671.2	114,294
Lawn Equipment Manufacturing	7,513.7	6,148.4	613.4	756.6	2, 364.7	1, 224.3	117.3	33,995
Golf Courses	21,772.3	17,433.8	941.8	3, 396.7	13,532.2	7, 926.7	1,145.6	361,690
Total	57,936.2	41,417.3	3,520.4	13 ,003.2	35 ,071.5	23 ,036.7	2,419.7	822,848

As explained previously, the total economic impact is comprised of direct, indirect and induced components. Direct output impacts, representing sales by the turfgrass industry sectors, amounted to $41.42 Bn, indirect output impacts were $3.52 Bn., representing the value of purchased goods and services by the turfgrass industry, and induced impacts were $13.00 Bn, arising from consumer spending by industry employees (Table 3).

Individually, the five sectors of the turfgrass industry each contributed substantially to the total impacts. Sod producers created nearly $1.67 billion in gross output, representing roughly 3 percent of the total industry. Although this sector's share of revenue is relatively small due to its "product" rather than "service" orientation, its importance lies with the economic activity that is generated throughout the rest of the system. Without sod producers there would be less demand for lawncare services, retailing, and equipment manufacturing, particularly in the warmer southern states where seed is rarely used. Lawn equipment manufacturers, which also primarily offer a product rather than a service, contributed $7.51 Bn in total output, accounting for 13 percent industry share. Lawncare retailing was the third largest sector contributing $8.47 Bn in total output, representing nearly 15 percent share. Lawncare services were estimated to have generated $18.51 Bn in output impacts, representing nearly one-third share. Golf courses comprised the largest single component of gross output, $21.77 Bn or 37 percent of the industry. The last two sectors — lawncare services and golf courses — are

heavily weighted towards value added services and, consequently, account for the greatest share of economic impacts.

For employment impacts of the turfgrass industry, 44 percent of jobs (361,690) were derived from golf courses, 36 percent from lawn care services (295,841), 14 percent from lawncare retailing (114,294), 4 percent from lawn equipment manufacturing, and 2 percent by the sod production industry (Figure 3). This employment created $23.0 Bn in labor income and paid $2.4 billion in indirect business taxes. Labor income contributes to economic activity by creating demand as employees spend their earnings on other goods and services such as food, housing, clothes, and recreational pursuits. Although "jobs created" and labor income are crucial measures of economic activity, by themselves they do not tell the entire story of an industry's contribution to society. As will be shown later, a sector can have low employment levels but, because of its high product value, service value or regional trade value, still contribute substantially to a local or national economy.

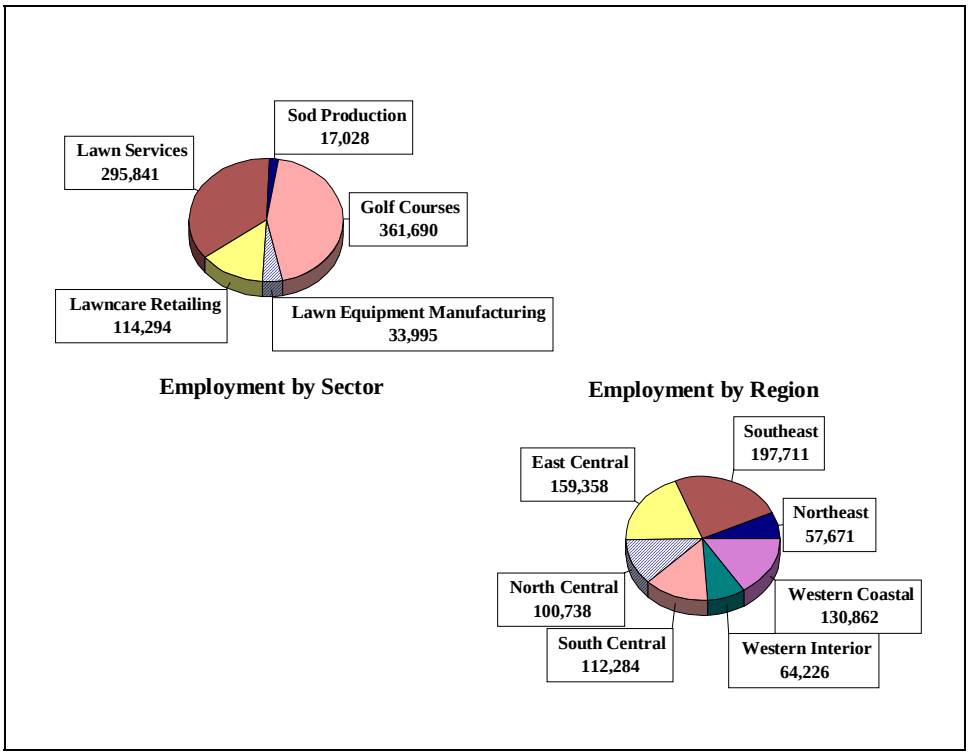


Figure 2. Employment impacts of the U.S. turfgrass and lawncare industry, by sector and region, 2002.

State and Regional Impacts

Employment and value added impacts of the turfgrass industry are summarized by sector, state and region in Table 4. Seven regions were defined for this study: 1) *Northeast* — Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont; 2) *Southeast* — Alabama, Florida, Georgia, North Carolina, South Carolina, and Tennessee; 3) *East Central* — Delaware, Kentucky, Maryland, Michigan, New Jersey, Ohio, Pennsylvania, Virginia, and West Virginia; 4) *North Central* — Illinois, Indiana, Iowa, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin; 5) *South Central* — Arkansas, Kansas, Louisiana, Mississippi, Missouri, Oklahoma, and Texas; 6) *Western Interior* — Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming; and 7) *Western Coastal* — Alaska, California, Hawaii, Oregon, and Washington.

Of the seven regions, the Southeast comprised the largest share of total employment with roughly one-quarter (197,711) of all jobs and 22 percent ($7.9 Bn) of value added impacts. It should be noted, however, that these rankings are based on total impacts only and that considerable variation exists across regions when discussing the five turfgrass sectors. For instance, the Southeast was first in sod production and equipment manufacturing, but fifth in lawncare retailing. Similarly, the North Central region was ranked fifth overall, but was second in equipment manufacturing. This indicates that product or service specialization varies considerably across regions. The East Central region, constituting 19 percent of total employment and 20

percent of value added, was a close second in regional rankings. In third place was the Western Coastal region accounting for 16 percent of employment impacts and 15 percent of value added. South Central region was ranked fourth with 14 percent share of employment and 11 percent in value added. Rankings for remaining regions were North Central (5th place), Western Interior (6th), and the Northeast (7th).

The top ten individual states in terms of employment impacts were California (101,022 jobs), Florida (83,944), Texas (52,784), Ohio (33,154), Illinois (31,625), Pennsylvania (30,845), North Carolina (28,860), Georgia (27,327), South Carolina (25,083) and New York (23,965).

Table 4. Employment and value added impacts of the U.S. turfgrass and lawncare industry by state, region and industry group, 2002.

State/Region	Employment Impacts (jobs)						Value Added Impacts (Mn$)					
	Sod Pro-duction	Lawn Services	Lawncare Retailing	Eqmt. Manuf.	Golf Courses	Total	Sod Pro-duction	Lawn Services	Lawncare Retailing	Eqmt. Manuf.	Golf Courses	Total
Total U.S.	**17,028**	**295,841**	**114,294**	**33,995**	**361,690**	**822,849**	**1,266.3**	**12,425.1**	**5,483.1**	**2,364.7**	**13,532.2**	**35,071.5**
Northeast	**558**	**22,053**	**7,814**	**741**	**26,505**	**57,671**	**36.6**	**1,253.5**	**424.7**	**57.1**	**1,424.1**	**3,196.0**
Connecticut	61	4,399	1,233	0	4,257	9,950	4.	8	259.1	72.7	0.	0	216.6	553.3
Maine	62	1,210	524	10	909	2,715	3.6	51.4	21.	8	0.7	44.8	122.3
Massachusetts	30	6,038	1,390	0	6,576	14,033	1.	0	371.0	80.8	0.	0	342.0	794.8
New Hampshire	9	1,401	523	0	1,156	3,089	0.	3	68.2	26.5	0.	0	70.0	165.1
New York	248	7,540	3,666	722	11,789	23,965	20.5	425.9	201.	6	55.7	653.1	1,356.8
Rhode Island	148	954	80	0	1,555	2,737	6.2	52.7	4.	0	0.0	75.8	138.7
Vermont	0	511	398	10	263	1,181	0.0	25.2	17.	2	0.8	21.8	65.0
Southeast	**7,261**	**62,508**	**16,762**	**13,414**	**97,766**	**197,711**	**615.0**	**2,262.5**	**798.9**	**867.4**	**3,353.4**	**7,897.3**
Alabama	1,115	4,177	1,329	59	5,354	12,033	102.4	141.5	56.	8	4.3	159.0	464.0
Florida 3,	544	25,281	4,114	67	50,938	83,944	294.3	895.2	200.0	3.7	1,926.5	3,319.7
Georgia	761	10,290	3,333	2,409	10,534	27,327	99.5	393.	8	176.2	155.1	325.	2	1,149.7
North Carolina	265	11,390	3,487	355	13,362	28,860	43.7	409.8	159.	1	31.6	398.0	1,042.2
South Carolina	651	6,017	1,427	5,211	11,777	25,083	55.7	211.	8	63.0	318.8	349.	4	998.6
Tennessee	926	5,353	3,071	5,313	5,801	20,463	19.3	210.	5	143.8	354.0	195.	3	923.1
East Central	**2,092**	**62,670**	**23,065**	**3,618**	**67,913**	**159,358**	**125.6**	**2,790.9**	**1,109.2**	**292.2**	**2,642.4**	**6,960.3**
Delaware	41	1,238	271	0	1,308	2,858	7.	2	48.1	13.1	0.	0	48.5	116.8
Kentucky 237		2,271	2,348	7	3,528	8,390	13.6	80.5	100.2	0.5	105.1	299.8
Maryland	145	8,924	2,082	10	5,896	17,056	14.6	407.	5	109.2	0.8	225.	9	758.0
Michigan	317	6,820	3,332	522	10,925	21,916	17.2	370.3	165.	4	65.2	588.6	1,206.6
New Jersey	583	9,200	1,653	54	7,231	18,722	33.6	472.9	96.	7	4.8	349.2	957.2
Ohio	318	12,821	4,515	2,117	13,383	33,154	17.8	516.	9	203.2	152.1	482.	3	1,372.1
Pennsylvania	74	10,067	4,578	166	15,960	30,845	5.1	454.1	219.	7	15.3	548.8	1,243.0
Virginia	363	10,370	3,781	741	8,440	23,694	16.4	408.6	182.	3	53.6	256.1	917.0
West Virginia	14	960	505	0	1,243	2,723	0.	1	32.2	19.5	0.	0	38.0	89.8
North Central	**1,166**	**27,875**	**22,541**	**9,604**	**39,552**	**100,738**	**93.0**	**1,426.3**	**1,025.1**	**749.1**	**1,608.8**	**4,902.2**
Illinois	237	10,303	5,218	1,819	14,049	31,625	22.2	623.	9	267.8	140.4	612.	7	1,666.9
Indiana	169	5,907	3,568	1,133	8,053	18,831	12.	3	249.4	157.4	74.	9	311.8	805.7
Iowa	117	1,754	2,797	124	4,551	9,343	9.8	69.6	117.	4	7.1	161.8	365.7
Minnesota	424	3,910	3,352	1,037	3,868	12,590	31.	9	201.3	161.2	75.	1	195.7	665.2
Nebraska	61	1,116	2,087	87	2,058	5,408	5.9	45.1	84.	6	6.2	64.1	205.9
North Dakota	1	188	631	9	255	1,084	0.	0	7.0	23.8	0.	7	11.7	43.2
South Dakota	4	278	1,029	11	804	2,126	0.4	8.8	39.	4	0.9	31.7	81.2
Wisconsin	154	4,418	3,861	5,383	5,915	19,731	10.5	221.	1	173.5	443.9	219.	3	1,068.4
South Central	**4,085**	**34,481**	**21,117**	**4,932**	**47,669**	**112,284**	**222.6**	**1,188.0**	**954.1**	**273.4**	**1,450.9**	**4,089.1**
Arkansas	347	1,671	1,488	2,511	2,642	8,659	32.7	53.	9	57.1	122.6	70.	4	336.6
Kansas 107		2,234	2,092	475	3,399	8,307	9.2	86.1	88.1	34.4	100.8	318.6
Louisiana	132	1,931	1,879	10	4,927	8,879	8.0	55.2	78.	1	0.7	162.4	304.3
Mississippi	222	1,259	1,472	1,023	3,355	7,331	17.	2	37.1	57.5	59.	6	101.9	273.3
Missouri	308	4,238	4,055	815	7,799	17,214	13.7	157.3	185.	4	49.6	296.8	702.7

State/Region	Employment Impacts (jobs)						Value Added Impacts (Mn$)					
	Sod Pro-duction	Lawn Services	Lawncare Retailing	Eqmt. Manuf.	Golf Courses	Total	Sod Pro-duction	Lawn Services	Lawncare Retailing	Eqmt. Manuf.	Golf Courses	Total
Oklahoma	993	3,037	1,862	61	3,159	9,110	42.7	69.7	75.3	4.4	81.4	273.4
Texas	1,976	20,113	8,270	38	22,388	52,784	99.1	728.9	412.7	2.2	637.2	1,880.0
Western Interior	**975**	**26,371**	**8,459**	**913**	**27,507**	**64,226**	**104.0**	**1,057.9**	**393.4**	**63.8**	**1,042.3**	**2,661.5**
Arizona	109	9,164	1,612	892	11,120	22,897	15.3	324.6	77.1	62.3	339.3	818.6
Colorado	287	7,133	2,132	11	5,320	14,883	28.5	328.0	111.7	0.7	267.3	736.2
Idaho	190	1,401	1,390	0	1,255	4,236	25.1	54.5	61.2	0.0	43.5	184.3
Montana	47	366	887	0	1,025	2,325	3.8	13.6	33.9	0.0	43.2	94.5
Nevada	31	4,959	503	0	5,379	10,872	3.9	213.0	26.9	0.0	231.9	475.7
New Mexico	45	1,322	631	0	1,171	3,169	5.9	42.1	26.2	0.0	30.7	105.0
Utah	245	1,744	1,072	11	1,758	4,830	19.8	68.3	46.9	0.8	69.1	204.8
Wyoming	21	280	233	0	479	1,013	1.9	13.9	9.3	0.0	17.3	42.4
Western Coastal	**893**	**59,884**	**14,536**	**772**	**54,777**	**130,862**	**69.6**	**2,445.9**	**777.8**	**61.6**	**2,010.2**	**5,365.1**
Alaska	4	173	96	0	77	350	0.3	10.9	4.7	0.0	2.9	18.9
California	553	48,547	9,370	693	41,858	101,022	48.7	1,971.8	525.2	56.2	1,539.9	4,141.7
Hawaii	7	1,653	216	0	3,848	5,724	0.4	65.0	10.6	0.0	152.5	228.5
Oregon	154	3,556	2,113	62	3,610	9,495	7.0	141.8	97.8	4.0	124.1	374.7
Washington	174	5,954	2,742	17	5,383	14,270	13.2	256.4	139.5	1.5	190.8	601.3

The Sod Production Sector

The sod and seed production sector is the beginning of the market chain for the turfgrass industry. According to the 2002 Census of Agriculture, a total of 2,124 sod production firms were in operation in 2002 (USDA, 2004), as summarized in Table 5. Of the top 10 states, two stood out in terms of farm numbers: Florida with 235 and Texas with 205. A second tier with roughly half these farm numbers was Alabama (96), Oklahoma (95), Georgia (92), Minnesota (89), and North Carolina (87). A third tier included Wisconsin (63), California (62), and Ohio (62). Altogether the top 10 states comprised just over half of all firms in the United States. Census figures show a total of 386,505 acres in production in 2002 of which roughly two-thirds (250,432 acres) were harvested and sold. Other characteristics of sod production, including percent of area harvested, average product prices, and share of sales outside the state, are summarized regionally from survey data in Table 6.

When ranking the top 10 states in terms of total economic impact for sod production, four tiers are readily apparent. Florida clearly held the top tier with nearly 20 percent of the U.S. total, or $319 Mn (Figure 3). Texas was alone in the second tier with $168 Mn in total gross output. Together these two states accounted for nearly one-third (30%) of total U.S. output impact. Alabama at $108 Mn and Georgia with $106 Mn in output impacts were closely tied for third and fourth place, representing the third tier. The fourth tier consisted of Oklahoma ($77 Mn), California ($70 Mn), Minnesota ($65 Mn), South Carolina ($59 Mn), Colorado ($47 Mn), and North Carolina ($46 Mn). All totaled, the top 10 states accounted for $1.06 Bn or 64 percent of output impacts generated in the United States. When comparing state-level firm numbers discussed in the first paragraph, and economic impacts in this paragraph, a fairly strong correlation between farm numbers and value is apparent. However, it is important not to over-generalize that more firms per state always result in greater impacts. For instance, Wisconsin and Ohio were ranked in the top 10 states with regard to number of firms, but were not in the top ten with regard to economic impacts, where they were replaced by Colorado and South Carolina. As will be seen later, much depends on the value of the product or service supplied by a particular industry. Lawn-equipment manufacturers, for instance, are relatively few compared to other turfgrass sectors, but they represent considerable economic value because of the high cost of equipment they produce.

Table 5. U.S. sod farms, production area and harvested area, 2002

State Farm	s	Production Area in the Open (Acres)	Harvested Area (Acres)*
Alabama 96		25,805	17,057
Alaska 2		130	86
Arizona 13		3,187	1,689
Arkansas 58		8,998	5,948
California 62		15,909	10,516
Colorado 48		7,767	4,117
Connecticut 10		1,251	609
Delaware 6		2,305	1,044
Florida 23	5	92,990	62,836
Georgia 92		24,653	16,296
Hawaii 20		113	75
Idaho 38		4,704	2,493
Illinois 40		7,994	3,893
Indiana 38		5,076	2,472
Iowa 33		4,836	2,355
Kansas 49		4,971	3,286
Kentucky 54		4,692	2,125
Louisiana 23		2,747	1,816
Maine 10		1,151	561
Maryland 29		4,987	2,259
Massachusetts 6		390	190
Michigan 54		10,262	4,649
Minnesota	89	14,564	7,093
Mississippi 47		4,352	2,877
Missouri 53		6,002	3,967
Montana 16		1,232	653
Nebraska 38		3,015	1,468
Nevada 11		720	382
New Hampshire	2	130	63
New Jersey	53	12,485	5,656
New Mexico	5	1,186	629
New York	14	6,868	3,345
North Carolina	87	10,952	7,239
North Dakota	3	27	13
Ohio 62		9,434	4,274
Oklahoma 95		17,846	11,796
Oregon 14		2,608	1,724
Pennsylvania 24		2,100	951
Rhode Island	15	2,453	1,195
South Carolina	27	14,027	9,272
South Dakota	3	195	95
Tennessee 56		8,419	5,565
Texas 20	5	38,341	25,343
Utah 46		4,036	2,139
Vermont 3		3	1
Virginia 25		7,315	3,314
Washington 41		3,756	2,483
West Virginia	2	130	59
Wisconsin 63		4,399	2,142
Wyoming 9		610	323
Total U.S.	2,124	386,504	250,432

Source: 2002 Census of Agriculture, USDA, 2004.

*Estimated using harvest ratio information from survey data (see Table 6).

Table 6. Characteristics of U.S. sod producers surveyed, by region.

Region: States	Sample Size	Number Respon-dents	Production Area (Acres)	Percent of Area Harvested	Average Weighted Price ($/SqFt)	Share of Total Sales as Sod Products (%)	Share of Sales Outside State (%)
Northeast: Maine, New Hampshire, New York, Rhode Island	21	10	3,947	46.0	0.226	77.2	34.4
East Central: Delaware, Kentucky, Maryland, Michigan, New Jersey, Ohio, Pennsylvania, Virginia	99	25	12,451	45.3	0.157	81.2	4.8
Southeast: Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee	206	72	114,090	63.0	0.132	90.4	9.5
North Central: Illinois, Iowa, Minnesota, Nebraska, Wisconsin	78	18	11,620	48.7	0.161	80.7	22.7
South Central: Arkansas, Kansas, Missouri, Texas, Oklahoma	63	12	10,746	66.1	0.133	83.3	9.6
Western Interior: Colorado, Idaho, Montana, Nevada, Utah, Wyoming	65	12	4,725	53.0	0.215	84.8	14.7
Western Coastal: California, Oregon, Washington	49	10	8,785	92.2	0.235	93.3	0.9
Total	581	159	166,364				

Source: UF/IFAS Sod Producer Survey, 2005 (unpublished data).

Figure 4 illustrates the top 10 states in terms of employment impacts for sod production. Again, four tiers are discernable, with Florida holding the number one spot at 3,544 jobs. Texas is ranked second with 1,976 turfgrass-related jobs. A third tier is comprised of three states, Alabama with 1,115 jobs, Oklahoma with 993, and Tennessee with 926 employment positions. Five states comprised the fourth tier — Georgia, South Carolina, New Jersey, California, and Minnesota, with employment ranging from a high of 761 in the case of Georgia to a low of 424 for Minnesota. Altogether, the top 10 states accounted for 68 percent of total employment by the U.S. sod production sector.

Value added is an important measure of economic contribution because it represents the net income gain to a local, regional, or national economy due to the activity of a given sector. It is considered a net figure because all direct costs used in the production of the product or service has been subtracted from gross output. Thus, it is considered an unbiased indicator of economic importance. The top 10 states accounted for over two-thirds of the $1.27 Bn in value added for the U.S. sod production industry (Figure 7). Florida dominated with $294 Mn, followed by three states — Alabama ($102 Mn), Georgia ($100 Mn), and Texas with ($99 Mn). A third tier is comprised of South Carolina, California, North Carolina, Oklahoma, New Jersey, and Arkansas. Within this group, value added ranged from a high of $56 Mn for South Carolina to a low of $33 Mn for Arkansas. Again it is important to recognize that rankings in one category, such as employment or number of firms, do not guarantee a similar ranking with other indicators. For example, with value added, Alabama replaces Texas for second place and, for the first time, New Jersey reaches the top 10 status.

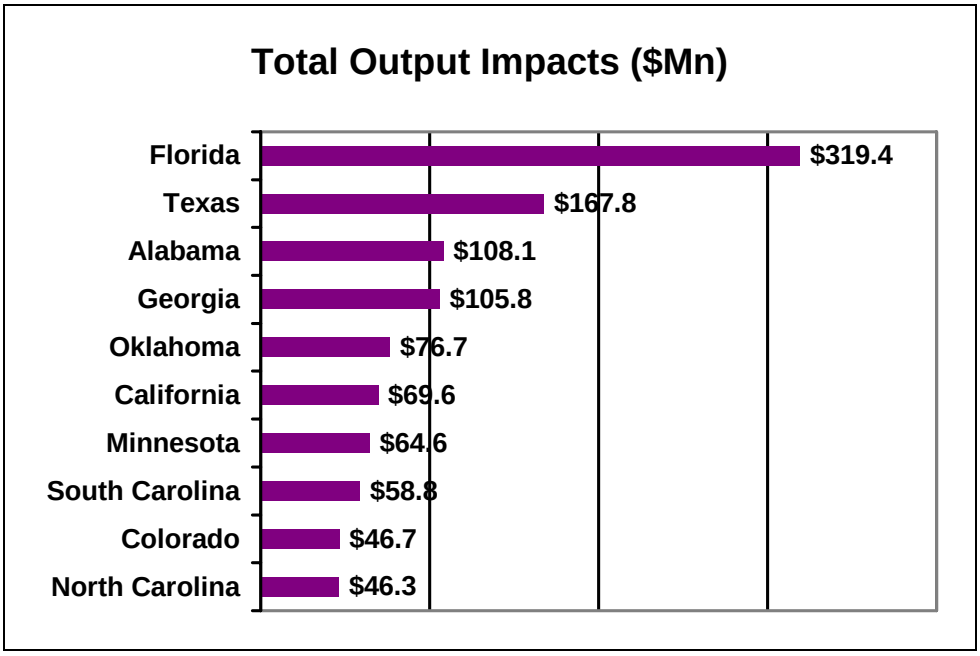


Figure 3. Top ten states for output impacts of the sod production sector, 2002.

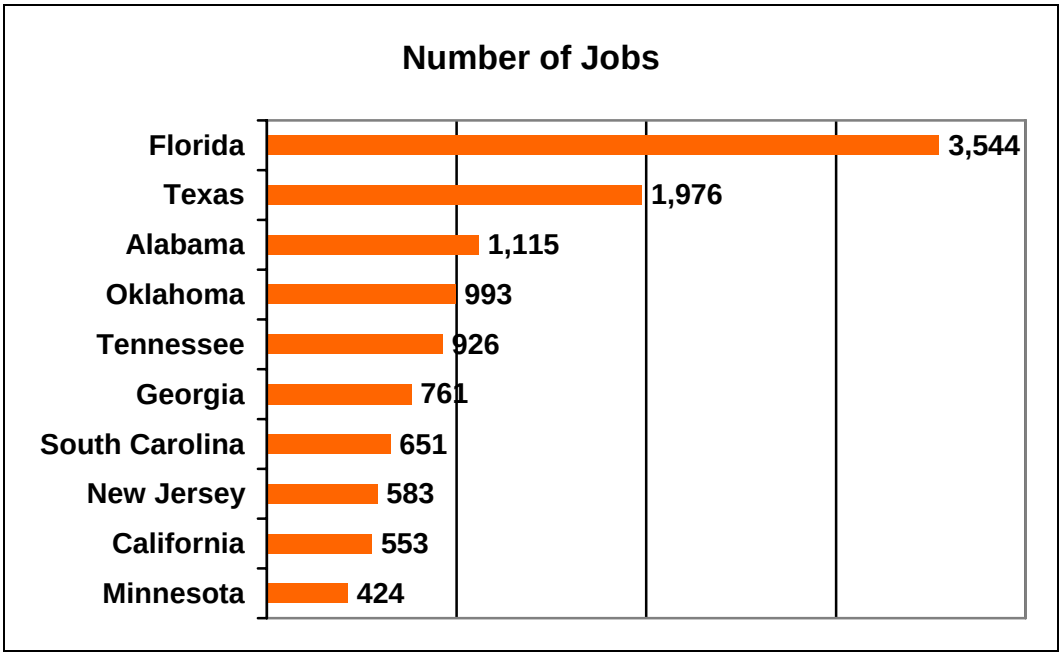


Figure 4. Top ten states for employment impacts of the sod production sector, 2002.

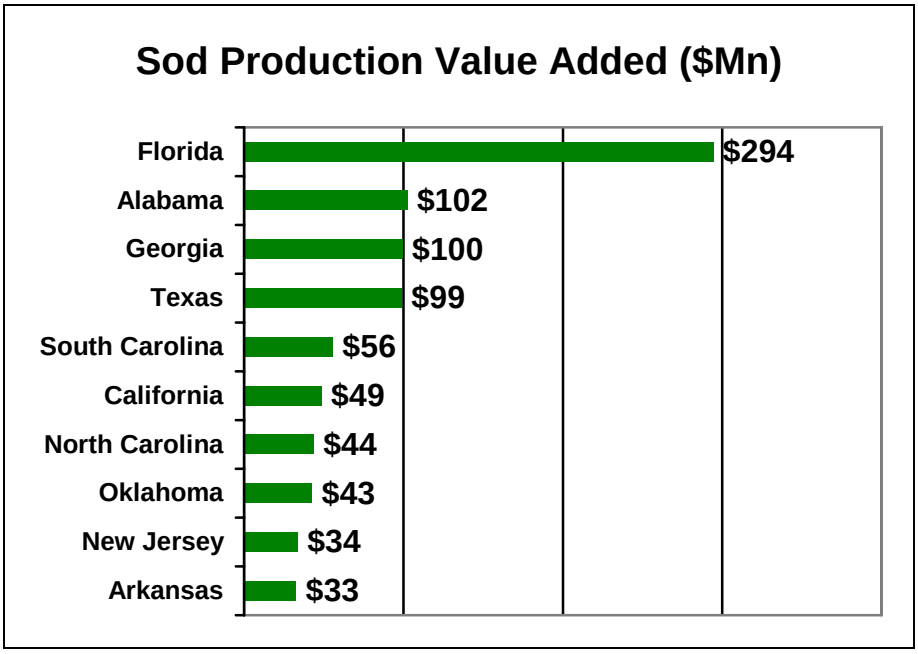


Figure 5. Top ten states for value added impacts of the sod production sector, 2002.

The Lawncare Services Sector

As defined previously, the lawncare services sector includes firms that provide *turfgrass-related horticultural services* and are a subset of the firms included in the NAICS sector entitled "Landscaping Services" (561730). This industry sector comprises those establishments primarily engaged in providing landscape care and maintenance services and/or installing trees, shrubs, plants, lawns, or gardens. As a secondary activity, these firms may also design landscapes and/or plans for the construction of walkways, retaining walls, decks, fences, ponds, and similar structures. As a cross-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 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, 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).

Sales from these lawncare-related specialty services were $8.59 billion, or over one-third (36%) of a $35.24 billion in total U.S. landscape services (Table 7). The top three sectors were lawn care services (SIC: 0782-0203), landscape contractors (SIC: 0782-9903), and lawn services (SIC: 0782-0200) accounting for over 80 percent of all revenues generated by this sector (U.S. Department of Labor, Standard Industrial Classification System).

The total value of lawncare services provided in 2002 totaled $12.8 Bn. Total economic impacts derived from the lawncare services sector include $18.5 Bn in output impacts, 295,481 jobs, and $12.4 Bn in economic value added (Appendix Table B-2). All 50 states reported lawncare services activity with the total number of firms per state ranging from 46 (in Alaska) to 3,643 in California. Thirteen states had over 1,000 service providers, while twelve others reported between 500 and 1000 service providers within their respective states. The top ten states represented a combined 20,559-lawncare service providers who accounted for 54 percent of the industry's total number of establishments.

Table 7. Value of U.S. turfgrass-related landscape services specialties**.**

Industry Description	Number Businesses	Employment (jobs)	Sales ($Mn)
Lawn services	9,348	36,391	1,396.2
Cemetery upkeep services	155	755	28.0
Fertilizing services, lawn	301	1,710	115.3
Lawn care services	24,475	66,202	2,759.8
Mowing services, lawn	2,017	4,298	149.8
Mulching services, lawn	112	637	38.8
Seeding services, lawn	206	1,191	79.9
Sodding contractor	532	3,112	148.9
Spraying services, lawn	300	2,094	75.3
Sprigging services, lawn	5	5	0.1
Turf installation services, except artificial	518	1,295	53.6
Bermuda sprigging services	32	150	6.5
Highway lawn and garden maintenance services	380	2,720	185.1
Lawn and garden services	6,034	19,834	750.1
Garden services	614	1,284	43.8
Garden maintenance services	187	1,372	52.6
Garden planting services	35	136	5.5
Landscape contractors	8,588	53,080	2,698.0
Total	53,840	196,266	8,587.2

Source: Dun & Bradstreet Information Services, 1997.

Figure 6 illustrates the top 10 states in terms of the total output impacts associated with lawncare service. These top 10 states represented $10.2 Bn in total output impacts, approximately 55 percent of the U.S. total. The top 3 states were California, Florida, and Texas with $2.9 Bn, $1.3 Bn, and $1.1 Bn in total output impacts, respectively, together representing 28 percent of the national total. Interestingly, Virginia and Maryland, though not in the top 10 in terms of the number of lawncare service providers in their states, were in the top 10 in terms of output impacts generated, displacing New York and Michigan, which had more establishments but lower output impacts.

In terms of total employment impacts, the lawncare services sector represented a total of 295,841 jobs, with the top 10 states representing 168,382 (57%) of the total number of jobs, as depicted in Figure 7. This time, Virginia and Georgia entered the top 10 in terms of total employment impacts in spite of the fact that each had fewer numbers of firms located in their respective states than the states they displaced (New York and Michigan). As before, the top three states were California, Florida, and Texas — more than doubling the number of jobs provided by the other top 10 states.

Total value added impacts of the top 10 states (Figure 8) amounted to $6.9 Bn, which was about 50 percent of the national total of $12.4 Bn. These results seem to indicate that the lawncare services sector represents substantial labor income impacts particularly in the top 10 states.

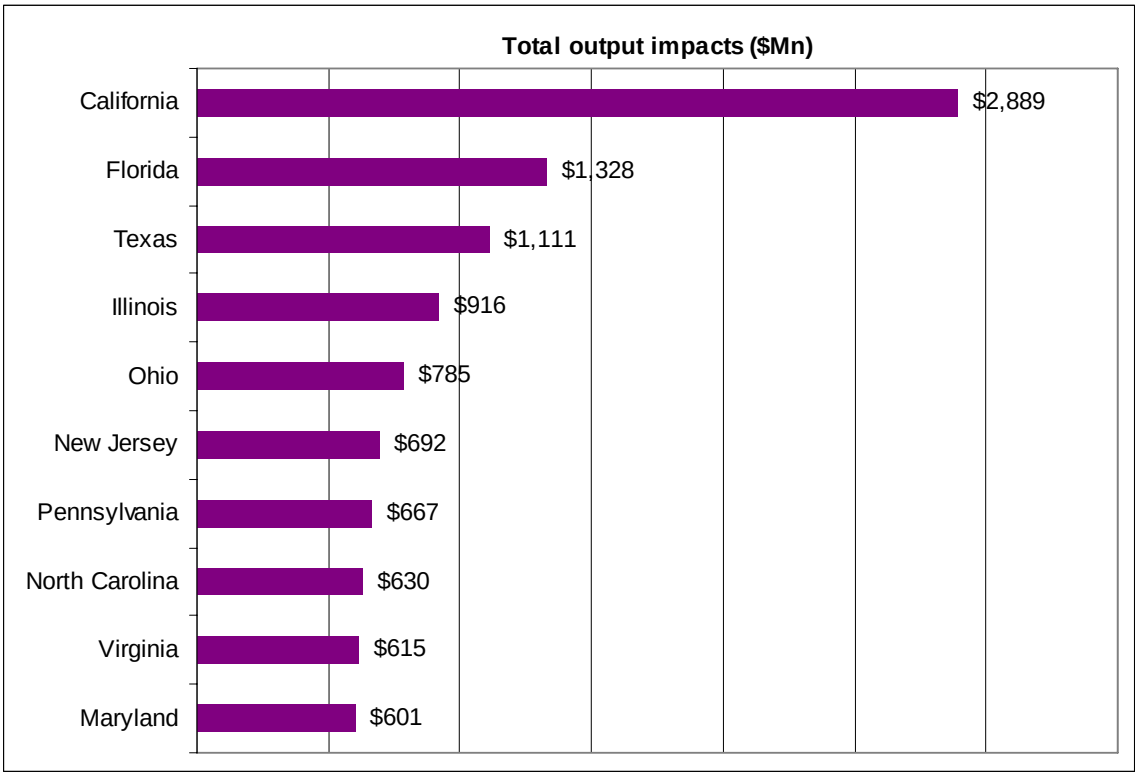


Figure 6. Top ten states for output impacts of the lawncare services sector, 2002.

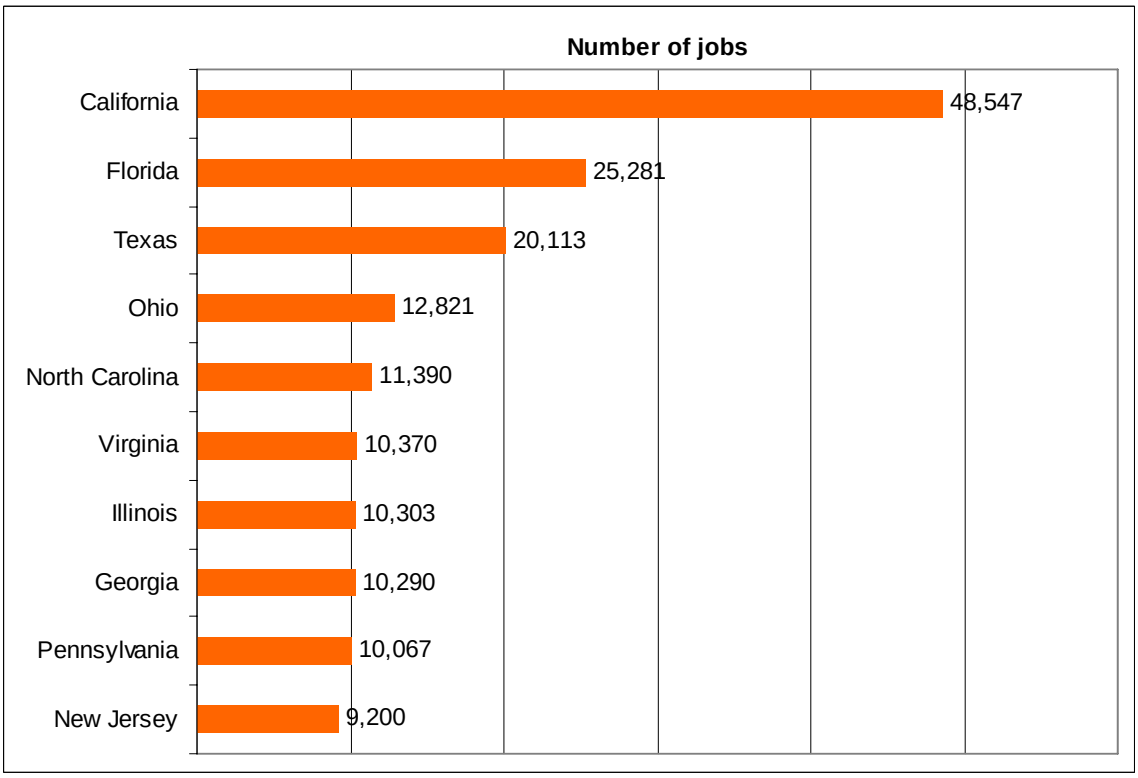


Figure 7. Top ten states for employment impacts of the lawncare services sector, 2002.

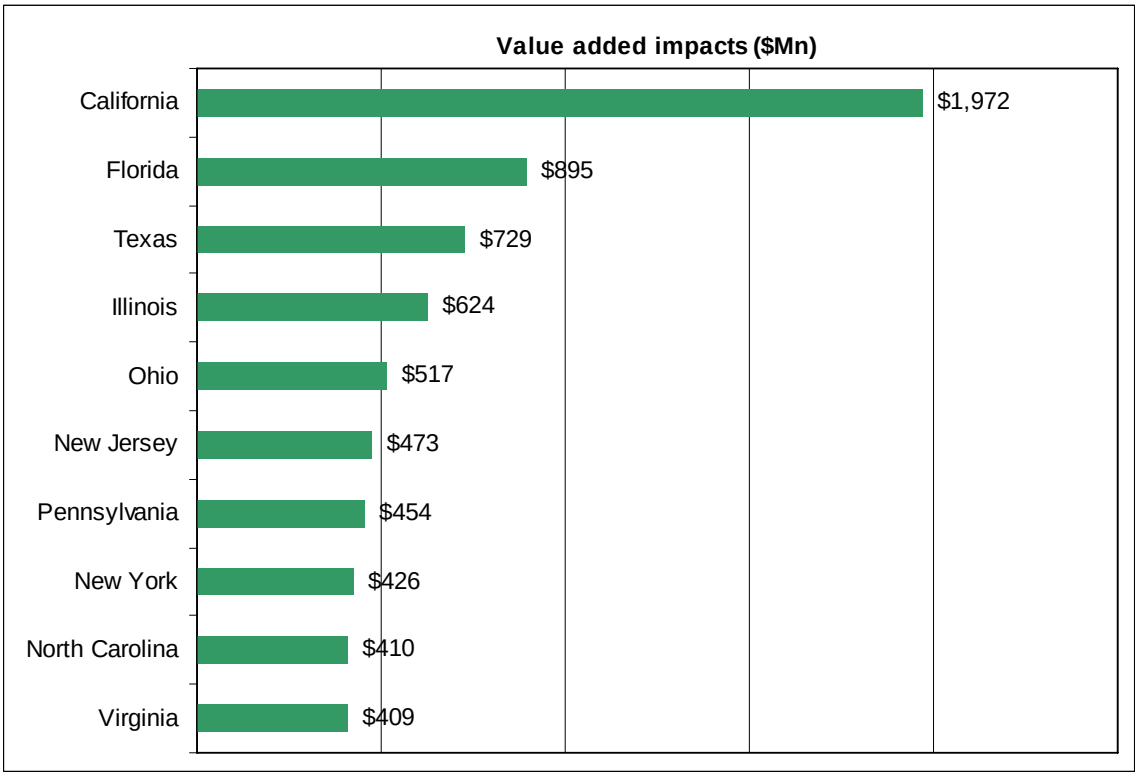


Figure 8. Top ten states for value added impacts of the lawncare services sector, 2002.

The Lawncare Goods Retailing Sector

As defined previously, the lawncare goods retailing sector includes firms that provide *turfgrass-related goods* and are a subset of the firms included in the NAICS sector entitled "Lawn and Garden Equipment and Supplies Stores" (4442) and "Home Centers" (44411). By definition, 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 and sell an assortment of turfgrass and turfgrass maintenance-related products.

The total value of turfgrass-related lawncare goods retailing in 2002 totaled $3.5 Bn. Appendix Table B-3 summarizes total economic impacts derived from the lawncare goods retailing sector including $8.5 Bn in output impacts, 114,294 jobs, and $5.5 Bn in economic value added. As stated earlier, the calculation for retail sectors assumed output is reduced to reflect only the gross margin on sales (29.5 percent) according to national averages of for lawn and garden stores and building materials and supply stores (U.S. Census Bureau, 2004b; 2004d). All 50 states reported lawncare goods retailing activity.

Figure 9 illustrates the top 10 states in terms of the total output impacts associated with lawncare goods retailing. These top 10 states represented $3.7 Bn in total output impacts, approximately 47 percent of the U.S. total. The top 3 states included California, Texas, and Illinois with $798 Mn, $645 Mn, and $417 Mn in total output impacts, respectively, representing 22 percent of the national total output. The next leading states in the top 10 (in terms of output impacts) included Pennsylvania, Ohio, Florida, New York, Missouri, Virginia and Wisconsin (in descending order).

In terms of total employment impacts, the lawncare goods retailing sector represented a total of 114,294 jobs, with the top 10 employing states representing 51,428 (45%) of the total (Figure 10). The same top 10 output impact states indicated above were also the top 10 employing states, although Missouri, Wisconsin, Virginia and New York changed with respect to the order they appeared in the top 10 employing states.

Total value added impacts of the top 10 states (Figure 11) amounted to $2.6 Bn, which was about 47 percent of the national total of $5.5 Bn. Georgia replaced Wisconsin in the top 10 states in terms of value added

impacts, with Wisconsin dropping to the 11th place spot. These results indicate that the lawncare goods retailing sector generates substantial labor income impacts and indirect business taxes, due to the high level of labor inputs in the retail sector.

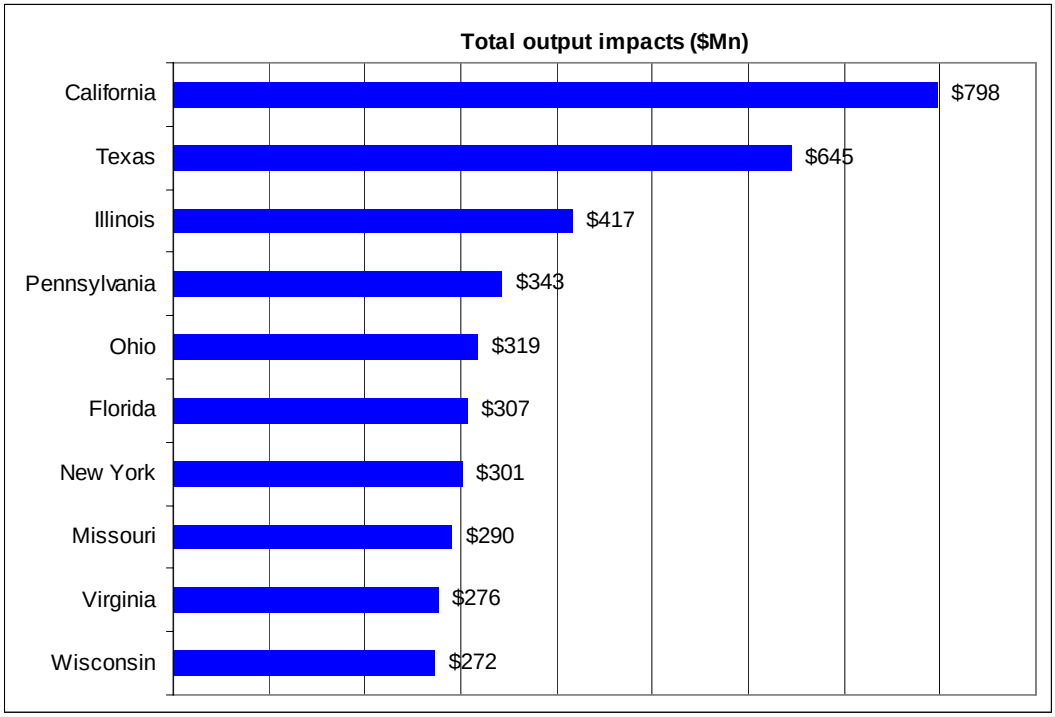


Figure 9. Top ten states for output impacts of the lawncare goods retailing sector, 2002.

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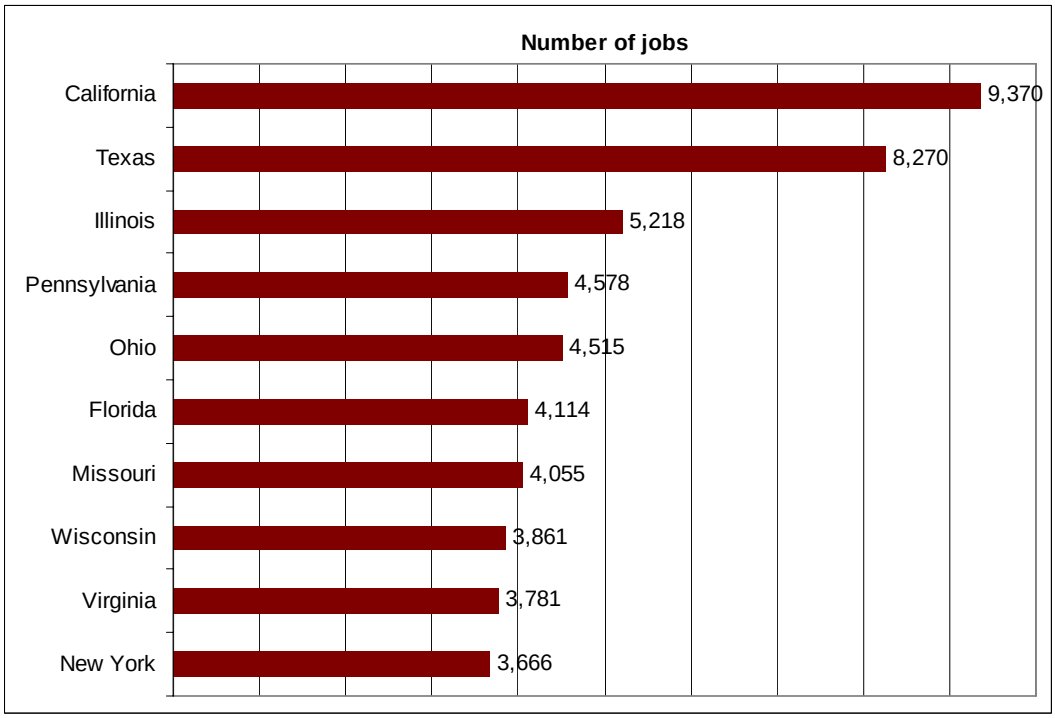

Figure 10. Top ten states for employment impacts of the lawncare goods retailing sector, 2002.

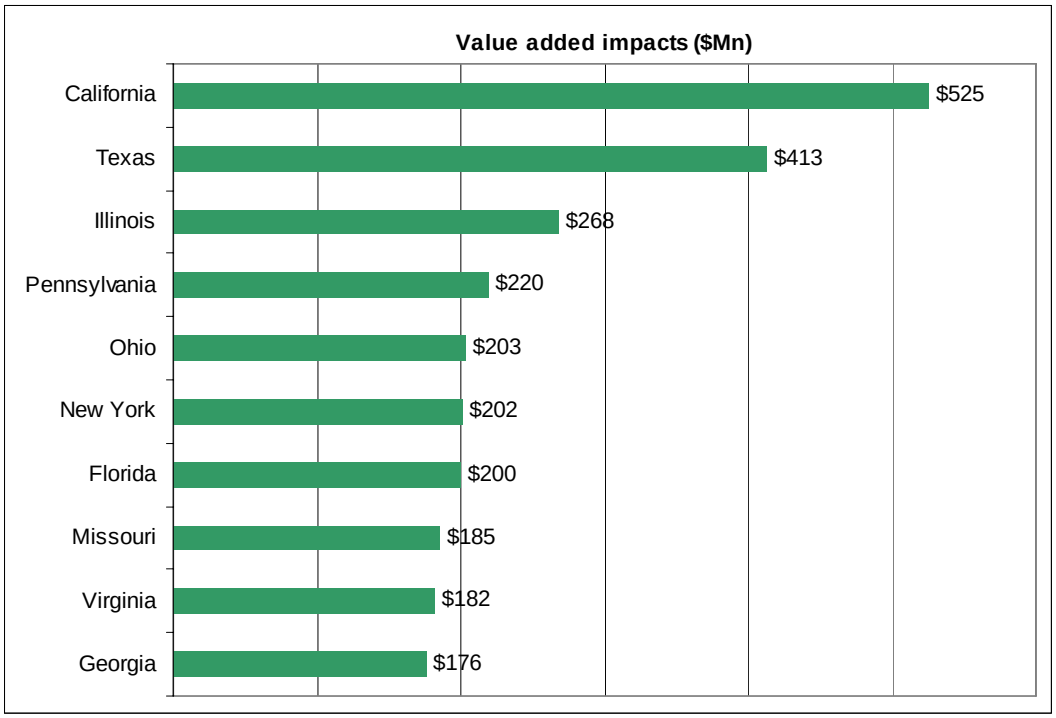

Figure 11. Top ten states for value added impacts of the lawncare goods retailing sector, 2002.

The Lawn Equipment Manufacturing Sector

As defined previously, the lawn equipment sector includes firms that manufacture commercial turf and grounds care equipment (including parts and attachments), push-type lawnmowers, powered lawn edgers/trimmers, yard vacuums and blowers, lawn tractors and riding mowers, and parts and attachments for consumer lawn and garden equipment. The total value of shipments of lawn equipment in 2002 totaled $6.1 Bn (Table 8). Appendix Table B-4 summarizes total economic impacts derived from the lawn equipment sector including $7.5 Bn in output impacts, 33,995 jobs, and $2.4 Bn in value added. Thirty-seven of the 50 states reported lawn equipment manufacturing activity with the total number of firms per state ranging from one (in 9 states) to twelve in Indiana. Four states had only 2 manufacturing locations, while nine others reported 3 manufacturing locations within their respective states. The top ten states represented a combined 81 manufacturing locations, which accounted for 54 percent of the industry's manufacturing sites. Lawn equipment was segregated into six different categories, accounting for a total of $6.15 billion in sales in 2003. Of the six categories, the top two in terms of sales were lawn tractors and riding mowers for homeowners ($2.2 Bn) and commercial turf and grounds care equipment at $1.7 Bn.

Table 8. Value of U.S. lawn equipment manufacturing shipments, 2002.

Type Equipment	Value of Shipments (Mn$)
Commercial turf & grounds care equipment, incl. parts & attachments	1,677.9
Push-type lawnmowers (consumer)	961.8
Powered lawn edgers/trimmers (consumer)	514.0
Yard vacuums & blowers (consumer)	222.3
Lawn tractors & riding mowers (consumer)	2,224.6
Parts and attachments for consumer lawn & garden equipment	547.9
Total 6,14	8.4

Source: U.S. Census Bureau, 2003a.

Figure 12 illustrates the top 10 states in terms of the total output impacts associated with lawn equipment manufacturing. These top 10 states represented $6.0 Bn in total output impacts, approximately 80 percent of the U.S. total. Interestingly, South Carolina, Arkansas, and Mississippi all entered the top 10 in terms of total output impacts in spite of indicating that they each had only 3 manufacturing firms located in their respective states. They displaced California, Michigan, and Pennsylvania in the top 10 even though these states had considerably higher numbers of firms represented (8, 6, and 10, respectively), reflecting the size and scale of their manufacturing sites. The top 3 states included Wisconsin, Tennessee, and South Carolina with $1.15 Bn, $1.09 Bn, and $1.08 Bn in total output impacts, respectively. The next closest state in terms of output impacts (Georgia) represented less than half of any of the top three states.

In terms of total employment impacts, the lawn equipment sector represented a total of 33,995 jobs, with the top 10 states representing 27,956 (82%) of the total number (Figure 13). Again, South Carolina, Arkansas, and Mississippi all entered the top 10 in terms of total employment impacts in spite of indicating that they each had only 3 manufacturing firms located in their respective states. They again displaced California, Michigan, and Pennsylvania, again reflecting perhaps the greater employment associated with the size and scale of their manufacturing sites. More than doubling the number of jobs of any of the other top 10 states, the top three states included Wisconsin, Tennessee, and South Carolina.

Total value added impacts of the top 10 states (Figure 14) amounted to $1.9 Bn, which was about 80 percent of the national total of $2.4 Bn. These results seem to indicate that the manufacturing of lawn equipment is highly concentrated geographically and represents substantial labor income impacts and indirect business taxes, particularly in the top 10 states.

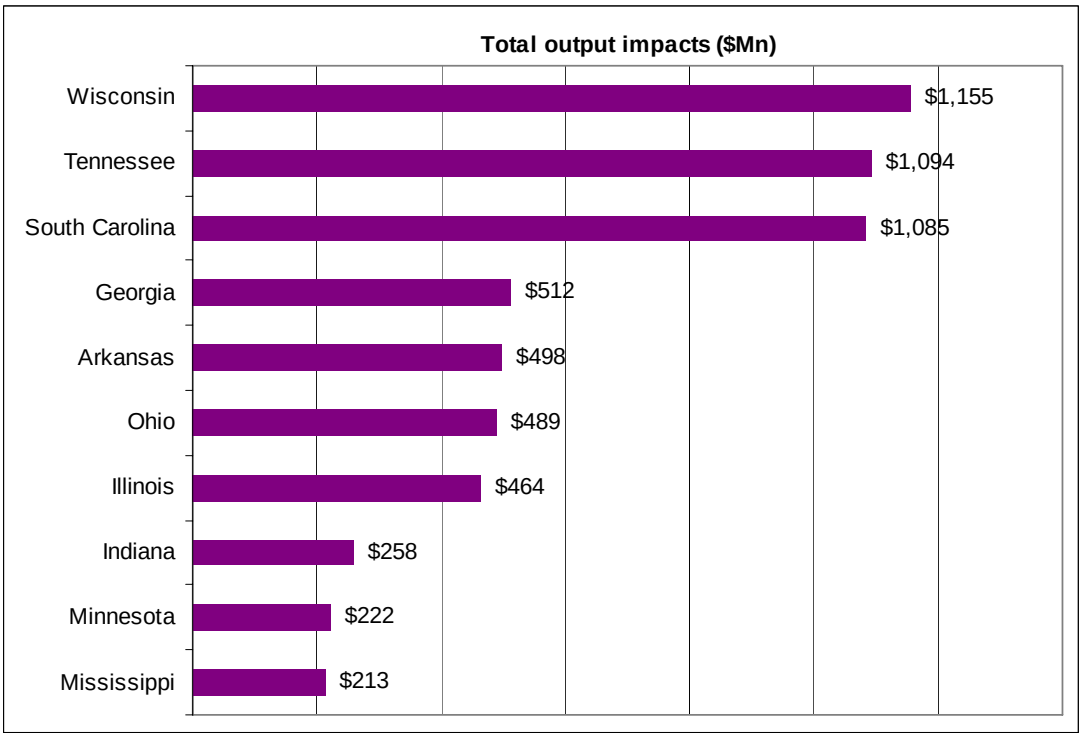

Figure 13. Top ten states for output impacts of the lawn equipment sector, 2002.

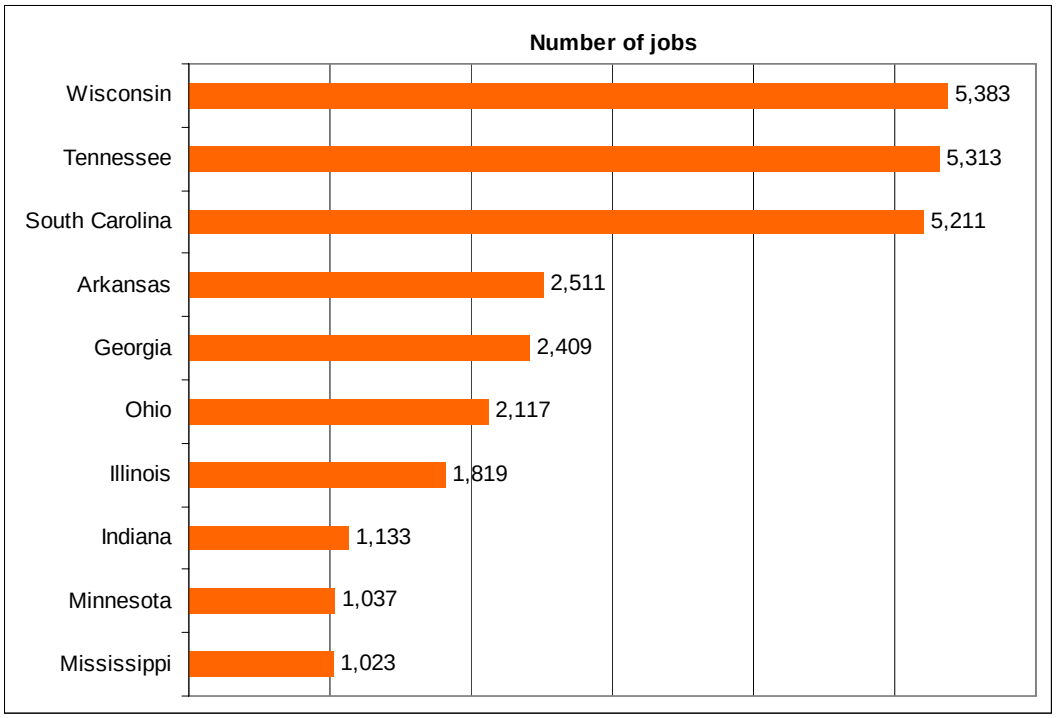

Figure 13. Top ten states for employment impacts of the lawn equipment sector, 2002.

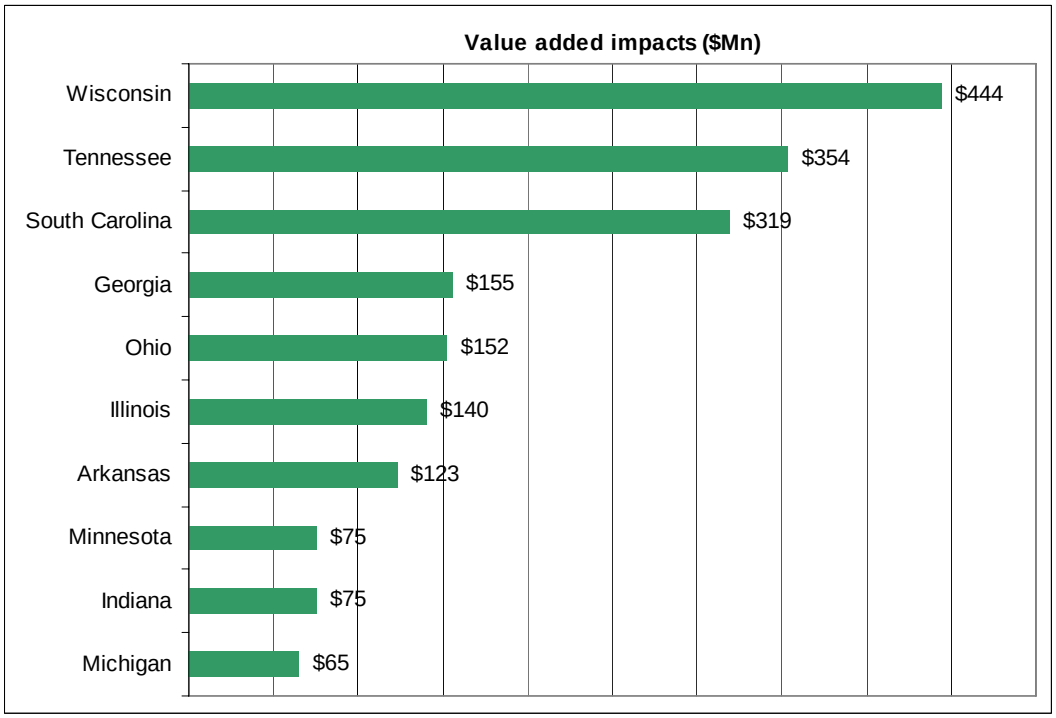

Figure 14. Top ten states for value added impacts of the lawn equipment sector, 2002.

The Golf Course Sector

Golf is a highly popular recreational activity in the United States. According to the National Golf Foundation, in 2004 there were over 16,000 golf facilities nationwide (NGF, 2005). A facility is defined as a complex that contains at least one golf course. Golf courses typically fall into eight categories, but are dominated by three major types — private, semi-private and public. Increasingly, residential developments are incorporating golf courses as part of their recreational facilities. In fact, about 60 percent of golf courses currently under construction will be part of a residential community, but only 22 percent of existing courses are part of a golf community. The five states with the most golf courses are: 1) Florida – 1,073; 2) California – 925; 3) Texas – 857; 4) Michigan – 852; and 5) New York – 822. This state ranking, including the total number of courses in the U.S., differs considerably from the Economic Census data used in the study (Appendix Table B-5). The government census data lists a total of 11,836 golf courses in the country, a difference of roughly 5,000 units (26%) compared to NGF data. This discrepancy is a result of two factors. First, the census data is for 2002, as opposed to the more recent (2004) NGF data. The second and most significant reason is due to the definition of a golf course establishment used by the U.S. Census Bureau. According to the definition given in the report, an establishment is typically a "single physical location". Related to this, when establishments had multiple economic activities, the one with the most dominant activity was selected. In this case, a golf course residing in an upscale residential community may not be recognized as a golf course, because it represents a lesser economic activity than the overall development. Therefore, the low number of golf courses reported is due to their classification under other industry sectors, such as residential developers, non-profit community associations, or municipal governments. As a consequence, the results presented below will be understated for golf courses. This underestimate is in the neighborhood of 25 percent nationally, but varies considerably more across independent states. For instance, NGF shows Florida with 1,073 facilities in 2004, but the Census data lists 587, a discrepancy of about 80 percent; California, on the other hand, has a difference of only 34 percent.

Of the five turfgrass sectors examined in this study, golf courses were the single largest component (37 percent) in terms of economic impact for 2002. In that year, the 11,836 U.S. golf facilities generated $21.8 Bn in output impacts, employed 361,690 people, and contributed $13.5 Bn in value added. This sector also provided $7.9 Bn in labor income and paid $1.1 Bn in indirect business taxes. Due primarily to this significance, it should be noted that, although turfgrass is a key input to golf operations, it is not the only one, even though in this study we are claiming all the economic impacts of golf courses. For instance, restaurants and lodging establishments rely on turfgrass only indirectly; yet contribute significantly to total impacts.

All 50 states were listed as having golf course establishments. The average number of establishments per state was 237, the fewest number (18) was located in Alaska and the most (689) situated in California. A listing of the top 10 states for the number of golf course firms, according to Census Bureau's estimates, are shown in Appendix Table B-5. As noted, California is ranked number one with the most golf courses (689), followed by New York (674), Michigan (652), Ohio (646), Pennsylvania (612), Florida (587), Texas (581), Illinois (497), North Carolina (456) and Wisconsin (393). Combined, the top 10 states comprised nearly half (49%) of all golf course establishments in the country. Total golf course output impacts for the top 10 states are illustrated in Figure 15. Florida contributed the largest economic impact with $3.1 Bn, followed closely by California with $2.5 Bn. The remaining eight states had output impacts ranging from New York ($1.0 Bn) to South Carolina ($565 Mn). Combined, the top 10 states contributed over half (57 percent) of golf course output impacts in the U.S. in 2002.

Golf course employment figures for the top 10 states are shown in Figure 16. State-level employment rankings differ somewhat from the output impact rankings discussed above. Florida and California are still number one and two, at 50,938 and 41,858 jobs, respectively. Texas, however has supplanted New York for third place, which is now number eight. Michigan, which was number six, is no longer in the top 10 and has been replaced by Arizona. Two reasons might explain the change in rankings across states when examining employment numbers. First, golf courses in some states may have invested more heavily in capital to offset the increasing cost of labor. For example, golf courses with more automated irrigation systems and technologically advanced maintenance equipment would conceivably reduce labor needs. Second, some establishments may provide a larger array of member services, such as restaurants and bars, clubhouses, and lodging places that would require additional labor resources. Combined, the top 10 states contributed over half (57 percent) of total golf course employment in the U.S. in 2002.

Estimates of the top 10 states for golf course value added are shown in Figure 17. State-level rankings for value added are exactly the same as for output impacts. The top two states in value added were Florida and

California with $1.9 Bn and $1.5 Bn, respectively. The remaining eight states ranged from a high of $653 Mn for New York to a low of $349 Mn for South Carolina. Altogether in 2002 the top 10 states provided 54 percent of golf course value added in the U.S.

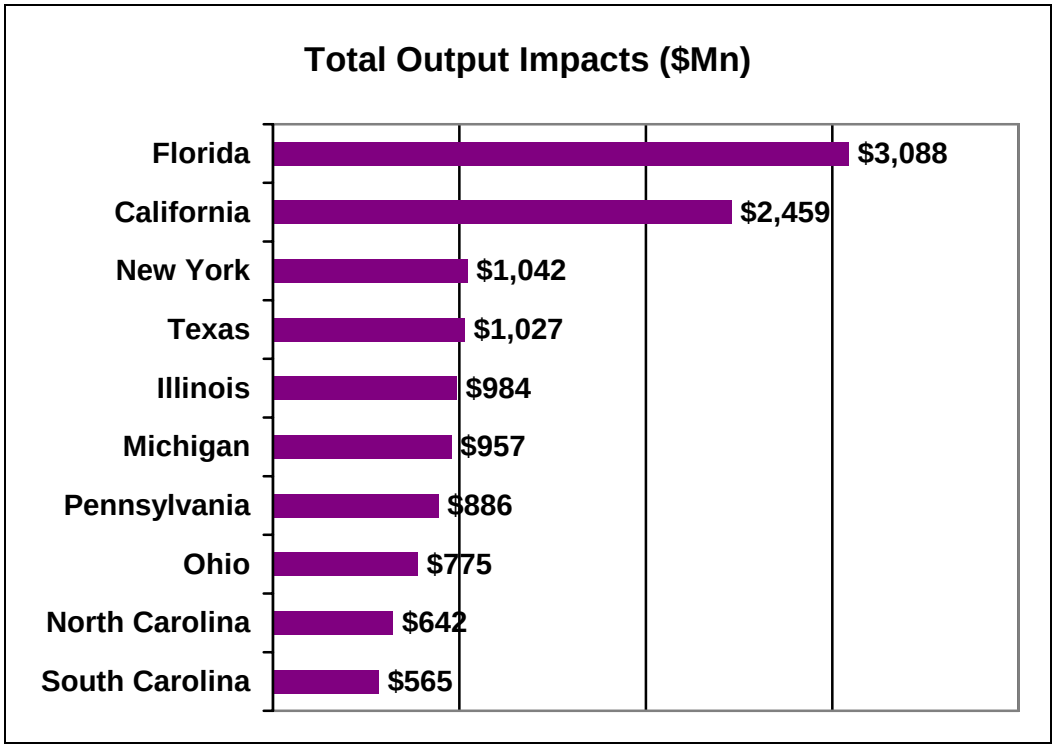

Figure 15. Top ten states for output impacts of the golf course sector, 2002.

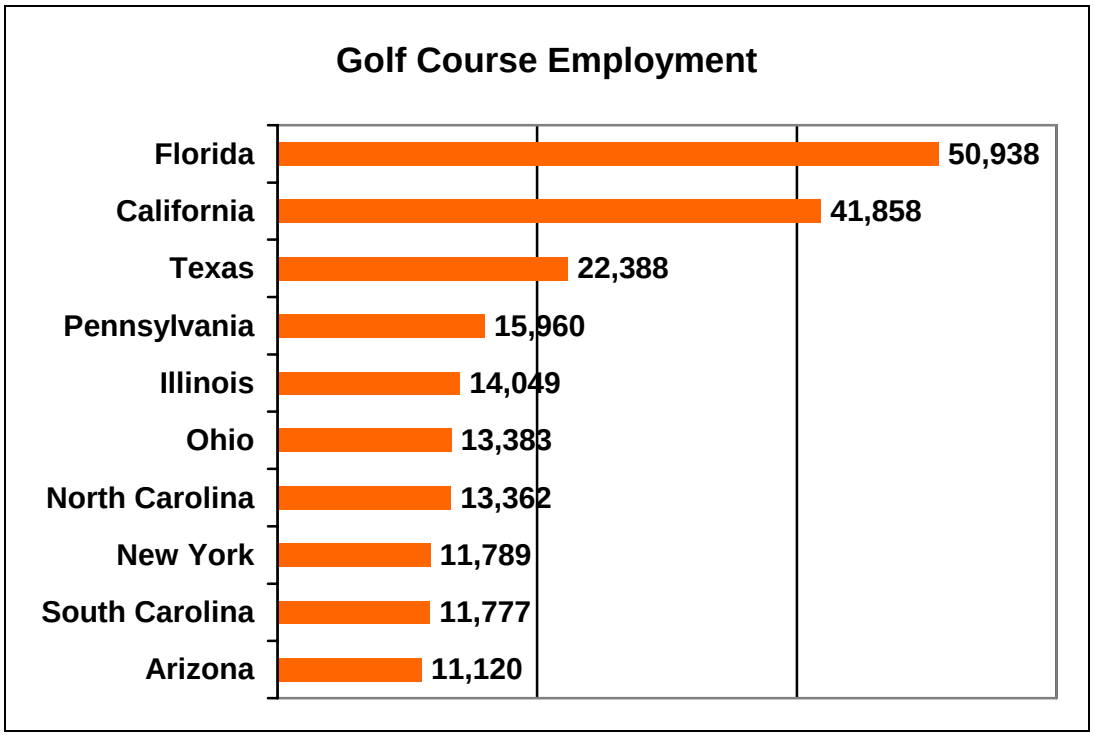

Figure 16. Top ten states for total employment impacts (jobs) of the golf course sector, 2002.

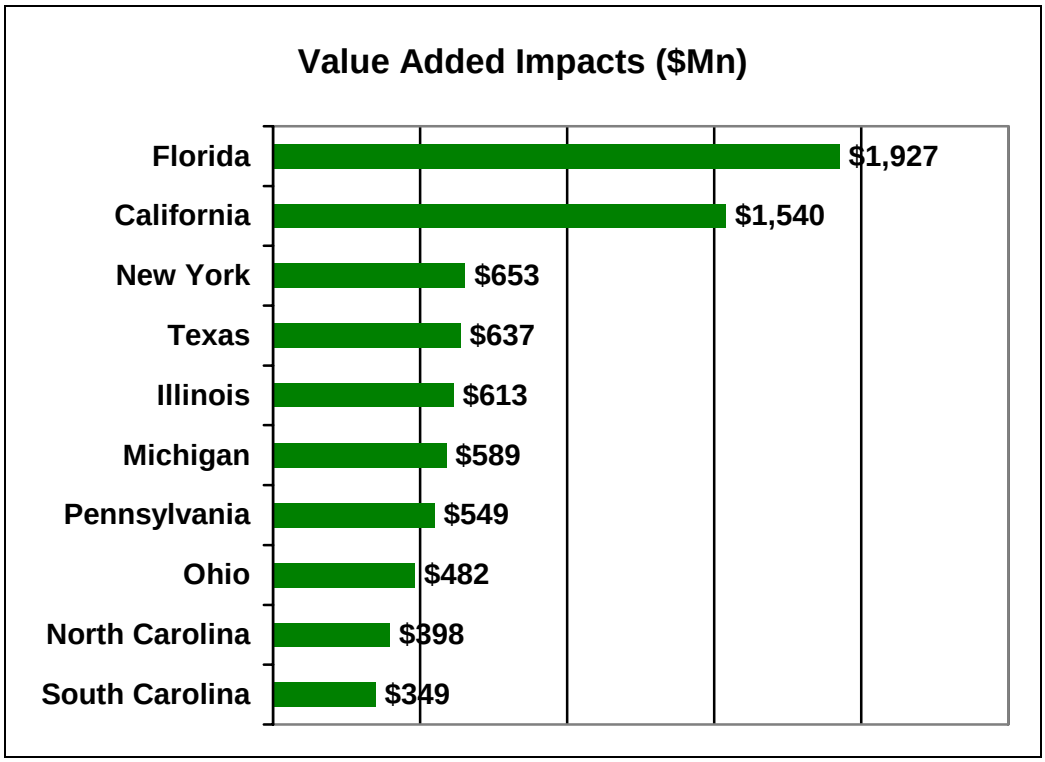

Figure 17. Top ten states for value added impacts of the golf course sector, 2002.

CONCLUSIONS

In this study, five sectors were examined to assess contributions of the turfgrass industry to the United States economy. These sectors included sod farms, lawncare services, lawncare retail stores, lawn equipment manufacturing, and golf courses. Missing from the study were several recreational sports groups that were not included due to an absence of secondary data. If data had existed for these other turf-based recreational activities, the estimated economic impact would have been even larger. Still, results from the five groups clearly indicate a large contribution to the national economy. Collectively, in 2005 dollars, these five sectors generated $62.2 Bn of total output impacts, $37.7 Bn in value added, remunerated $24.7 Bn in labor income, paid $2.6 Bn in indirect business taxes, and generated 822,849 jobs.

At the state level, economic impacts varied markedly by geographic location and type of impact being measured. For the sod production sector, southern states tended to dominate total output impacts due the warmer year-around climate and the higher proportion of sod grown vegetatively. For lawn care services, there was no discernable pattern across states. California was the single largest contributor, followed by Florida and Texas. Interestingly, central (Illinois, Ohio) and several northern states (New Jersey, Pennsylvania, Virginia and Maryland) were also in the top ten tier. For the lawn equipment sector, Wisconsin, Tennessee and South Carolina were the top three states, each with over a billion dollars in total output impacts. For the lawn care goods retailing sector, California and Texas stood out, followed by a mixture of southern, central and northern states. In the case of golf courses, Florida and California clearly dominated with $3.1 Bn and $2.5 Bn in output impacts, respectively, with New York, Texas, Illinois and Michigan comprising a secondary tier with roughly $1 Bn each.

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Appendix A—Economic Multipliers

Table A-1. Multipliers for sod farms (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).

Table A-2. Multipliers for lawncare services (services to buildings 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).

Table A-3. Multipliers for lawncare retailing (building materials and garden supplies 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	0.214	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).

Table A-4. Multipliers for lawn and garden equipment manufacturing.

State	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
	Direct	Indirec t	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).

Table A-5. Multipliers for golf courses (amusement, gambling and recreation services).

State	Output (dollars per dollar output)			Employment (jobs per million dollars output)			Value Added (dollars per dollar output)		
	Direct	Indirec t	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
Alabama	1.000	0.2592	0.8441	23.3	3.1	11.2	0.6160	0.1493	0.5130
Alaska	1.000	0.2372	0.7732	14.0	2.8	9.7	0.6247	0.1398	0.5278
Arizona	1.000	0.2940	1.0483	14.9	3.2	12.7	0.6238	0.1823	0.6497
Arkansas	1.000	0.2437	0.7528	24.0	3.1	10.7	0.6153	0.1353	0.4385
California	1.000	0.3474	1.2846	13.1	3.2	13.0	0.6256	0.2185	0.8090
Colorado	1.000	0.3365	1.2910	12.4	3.5	14.4	0.6261	0.2077	0.7998
Connecticut	1.000	0.3186	0.9282	11.6	2.9	9.4	0.6269	0.2053	0.5987
Delaware	1.000	0.2183	0.7417	17.7	2.3	8.8	0.6212	0.1316	0.4395
Florida	1.000	0.3229	1.2000	12.9	3.5	14.4	0.6257	0.2020	0.7452
Georgia	1.000	0.3289	1.1697	18.8	3.3	13.4	0.6202	0.2036	0.7307
Hawaii	1.000	0.2744	1.0683	15.6	3.4	14.0	0.6231	0.1652	0.7299
Idaho	1.000	0.2738	0.8498	22.2	3.7	12.5	0.6170	0.1588	0.5218
Illinois	1.000	0.3478	1.2607	12.3	3.3	13.2	0.6263	0.2141	0.7658
Indiana	1.000	0.2635	0.9177	9.8	3.0	11.3	0.6286	0.1538	0.5306
Iowa	1.000	0.2467	0.8235	10.1	3.1	11.1	0.6283	0.1410	0.4815
Kansas	1.000	0.2745	0.9245	19.9	3.2	12.0	0.6191	0.1582	0.5404
Kentucky	1.000	0.2369	0.7434	19.3	2.9	9.6	0.6197	0.1366	0.4381
Louisiana	1.000	0.2587	0.8946	11.2	3.2	12.4	0.6273	0.1507	0.5439
Maine	1.000	0.2293	0.8359	18.4	3.3	12.0	0.6205	0.1304	0.5121
Maryland	1.000	0.3097	1.2477	18.6	3.2	14.3	0.6203	0.1932	0.8317
Massachusetts	1.000	0.3178	1.0669	14.3	3.0	10.9	0.6244	0.2024	0.6776
Michigan	1.000	0.2936	0.9620	14.2	3.1	10.7	0.6244	0.1798	0.5621
Minnesota	1.000	0.3396	1.1835	20.1	3.6	13.6	0.6190	0.2063	0.7065
Mississippi	1.000	0.2209	0.7554	12.2	2.8	10.9	0.6263	0.1208	0.4523
Missouri	1.000	0.3192	1.0981	13.6	3.6	13.7	0.6250	0.1926	0.6558
Montana	1.000	0.2205	0.7750	19.8	3.3	11.8	0.6193	0.1214	0.4674
Nebraska	1.000	0.2740	0.9536	18.2	3.5	13.0	0.6208	0.1582	0.5660
Nevada	1.000	0.2543	0.9246	9.8	2.7	10.3	0.6285	0.1586	0.5828
New Hampshire	1.000	0.2772	0.9494	18.6	3.0	11.4	0.6203	0.1680	0.5689
New Jersey	1.000	0.3273	0.9123	9.0	3.0	9.1	0.6294	0.2054	0.5834
New Mexico	1.000	0.2813	0.8969	19.9	3.8	13.0	0.6192	0.1614	0.5737
New York	1.000	0.3285	0.9041	11.7	2.6	9.2	0.6269	0.2138	0.5838
North Carolina	1.000	0.2707	0.9720	19.3	3.1	12.2	0.6197	0.1592	0.5913
North Dakota	1.000	0.2287	0.6792	29.1	3.2	10.1	0.6106	0.1198	0.4056
Ohio	1.000	0.2931	0.8591	16.1	3.4	10.4	0.6227	0.1735	0.5065
Oklahoma	1.000	0.2881	0.9957	21.2	3.7	13.6	0.6180	0.1646	0.5958
Oregon	1.000	0.3222	0.9636	19.5	4.0	12.2	0.6196	0.1951	0.5937
Pennsylvania	1.000	0.3379	1.1084	19.7	3.4	12.4	0.6193	0.2049	0.6700
Rhode Island	1.000	0.2090	0.7460	15.0	2.4	9.2	0.6237	0.1253	0.4821
South Carolina	1.000	0.2369	0.8369	15.8	2.8	11.2	0.6230	0.1385	0.5153
South Dakota	1.000	0.2231	0.8183	19.1	2.8	11.9	0.6199	0.1255	0.4809
Tennessee	1.000	0.2943	1.0322	9.5	3.3	12.4	0.6288	0.1752	0.6108
Texas	1.000	0.3375	1.1790	18.8	3.4	12.9	0.6202	0.2044	0.7107
Utah	1.000	0.3061	1.2152	14.6	3.9	16.4	0.6241	0.1809	0.7340
Vermont	1.000	0.2612	0.8291	17.3	3.6	11.9	0.6216	0.1507	0.5126
Virginia	1.000	0.3002	1.0770	19.9	3.2	12.7	0.6192	0.1812	0.6956
Washington	1.000	0.2900	0.9189	16.0	3.2	10.4	0.6228	0.1753	0.5678
West Virginia	1.000	0.2068	0.6378	15.1	2.6	9.3	0.6237	0.1131	0.3881
Wisconsin	1.000	0.2870	0.9176	22.0	3.4	11.5	0.6172	0.1659	0.5394
Wyoming	1.000	0.2365	0.6838	19.3	3.0	10.0	0.6198	0.1359	0.4237

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

Appendix B—Economic Impacts by State

States listed by total output impact in descending order.

Table B-1. Economic impacts of sod production, by state, 2002.

State Far	ms	Harvest Value ($1000)	Export Sales ($1000)	Indirect Output Impact (Mn$)	Induced Output Impact (Mn$)	Total Output Impact (Mn$)	Emplo yment Impact (jobs)	Value Added Impact (Mn$)	Labor Income Impact (Mn$)	Indirect Business Tax Impact (Mn$)
Florida	235	306,800	9,204	0.5	12.1	319.4	3,544	294.3	130.9	5.4
Texas	205	146,826	14,095	5.4	15.6	167.8	1,976	99.1	54.2	2.3
Alabama	96	98,820	9,487	0.1	9.1	108.1	1,115	102.4	34.8	2.4
Georgia	92	94,408	9,063	0.1	11.3	105.8	761	99.5	35.6	2.4
Oklahoma	95	68,341	6,561	2.4	6.0	76.7	993	42.7	23.7	0.9
California	62	60,923	5,849	1.4	7.2	69.6	553	48.7	26.7	1.0
Minnesota	89	49,742	11,291	4.3	10.6	64.6	424	31.9	18.9	1.1
South Carolina	27	53,716	5,157	0.1	5.0	58.8	651	55.7	14.9	1.2
Colorado	48	38,553	5,667	1.6	6.6	46.7	287	28.5	16.9	0.7
North Carolina	87	41,941	4,026	0.1	4.4	46.3	265	43.7	15.0	1.0
New Jersey	53	38,679	1,857	0.2	1.6	40.5	583	33.6	16.5	0.6
Arkansas	58	34,458	3,308	0.2	2.8	37.5	347	32.7	14.2	0.7
Tennessee	56	32,240	3,095	1.2	2.8	36.2	926	19.3	10.6	0.4
Illinois	40	27,303	6,198	1.8	6.8	35.9	237	22.2	11.8	0.7
Michigan	54	31,792	1,526	0.5	1.2	33.5	317	17.2	0.2	0.2
Ohio	62	29,227	1,403	0.4	1.0	30.7	318	17.8	9.2	0.3
New York	14	23,457	5,325	0.8	4.4	28.7	248	20.5	11.7	0.5
Idaho	38	23,349	3,432	0.0	3.6	27.0	190	25.1	15.1	0.4
Missouri	53	22,985	2,207	0.7	2.0	25.8	308	13.7	7.6	0.3
Utah	46	20,033	2,945	0.3	3.9	24.2	245	19.8	11.4	0.4
Virginia	25	22,662	1,088	0.2	1.1	24.0	363	16.4	8.7	0.3
Indiana	38	17,337	3,935	1.2	3.1	21.6	169	12.3	6.6	0.4
Kansas	49	19,036	1,827	0.7	1.3	21.1	107	9.2	5.4	0.2
Iowa	33	16,517	3,749	1.2	2.4	20.1	117	9.8	5.1	0.3
Wisconsin	63	15,024	3,411	1.0	2.8	18.7	154	10.5	6.5	0.3
Arizona	13	15,819	2,325	0.2	2.6	18.6	109	15.3	8.3	0.3
Mississippi	47	16,666	1,600	0.0	1.4	18.1	222	17.2	7.1	0.4
Maryland	29	15,450	742	0.0	1.0	16.5	145	14.6	6.5	0.3
Washington	41	14,384	1,381	0.2	1.4	16.0	174	13.2	8.2	0.2
Kentucky	54	14,536	698	0.0	0.6	15.2	237	13.6	6.3	0.2
Nebraska	38	10,297	2,338	0.6	1.6	12.6	61	5.9	3.4	0.2
Louisiana	23	10,520	1,010	0.2	0.9	11.6	132	8.0	4.3	0.2
Oregon	14	9,987	959	0.3	0.9	11.2	154	7.0	4.8	0.1
Rhode Island	15	8,378	1,902	0.4	1.3	10.1	148	6.2	3.7	0.1
Delaware	6	7,141	343	0.0	0.3	7.4	41	7.2	2.4	0.2
Montana	16	6,115	899	0.2	0.6	6.9	47	3.8	2.2	0.1
Pennsylvania	24	6,506	312	0.1	0.3	6.9	74	5.1	2.9	0.1
New Mexico	5	5,887	865	0.1	0.9	6.8	45	5.9	3.4	0.1
Connecticut	10	4,273	970	0.0	1.0	5.3	61	4.8	2.5	0.1
Maine	10	3,931	892	0.1	0.8	4.8	62	3.6	2.1	0.1
Nevada	11	3,574	525	0.0	0.6	4.2	31	3.9	2.5	0.1
Wyoming	9	3,028	445	0.1	0.3	3.4	21	1.9	1.2	0.0
Massachusetts	6	1,333	303	0.1	0.3	1.7	30	1.0	0.7	0.0
South Dakota	3	667	151	0.0	0.1	0.8	4	0.4	0.2	0.0
New Hampshire	2	444	101	0.0	0.1	0.6	9	0.3	0.2	0.0
Alaska	2	498	48	0.0	0.0	0.5	4	0.3	0.1	0.0
Hawaii	20	433	42	0.0	0.1	0.5	7	0.4	0.3	0.0
West Virginia	2	403	19	0.0	0.0	0.4	14	0.1	0.1	0.0
North Dakota	3	92	21	0.0	0.0	0.1	1	0.0	0.0	0.0
Vermont	3	10	2	0.0	0.0	0.0	0	0.0	0.0	0.0
Total U.S.	2,124	1,494,543	144,598	28.9	146.2	1,669.6	17,028	1,266.3	585.8	27.2

Table B-2. Economic impacts of lawncare services, by state, 2002.

State	Establish -ments	Direct Employ ment	Direct Output ($Mn)	Indirect Output Impact (Mn$)	Induced Output Impact (Mn$)	Total Output Impact (Mn$)	Employ ment Impact (jobs)	Value Added Impact ($Mn)	Labor Income Impact ($Mn)	Indirect Business Tax Impact ($Mn)	Export Share
California	3,643	38,524	1,915	158	817	2,889	48,547	1,972	1,580	75	30.2%
Florida	3,160	20,097	901	74	353	1,328	25,281	895	714	34	30.1%
Texas	1,812	16,387	777	65	269	1,111	20,113	729	585	28	27.0%
Illinois	1,501	7,555	657	40	219	916	10,303	624	506	22	24.3%
Ohio	1,719	10,185	574	44	167	785	12,821	517	419	17	30.5%
New Jersey	1,787	7,203	494	41	158	692	9,200	473	383	17	30.9%
Pennsylvania	1,748	8,449	524	25	118	667	10,067	454	373	14	18.4%
North Carolina	1,312	7,995	361	50	219	630	11,390	410	318	18	55.3%
Virginia	1,022	7,945	413	35	166	615	10,370	409	328	15	34.3%
Maryland	801	6,212	368	36	197	601	8,924	407	324	16	39.4%
New York	2,408	7,089	547	8	36	592	7,540	426	361	10	6.7%
Georgia	1,136	8,416	419	27	135	581	10,290	394	318	14	25.1%
Michigan	1,469	5,588	438	20	87	545	6,820	370	11	11	18.7%
Massachusetts	1,237	4,240	374	30	140	544	6,038	371	300	14	32.0%
Colorado	763	5,148	317	28	147	492	7,133	328	262	13	34.2%
Arizona	688	6,890	300	32	155	487	9,164	325	256	14	45.4%
Indiana	798	4,453	268	21	93	383	5,907	249	200	9	34.7%
Washington	978	4,604	265	23	95	383	5,954	256	207	9	33.9%
Connecticut	897	3,075	250	25	103	377	4,399	259	207	10	39.7%
Wisconsin	739	3,043	228	19	87	334	4,418	221	177	8	37.2%
South Carolina	654	3,966	174	30	122	326	6,017	212	147	10	74.7%
Tennessee	598	3,972	207	20	90	318	5,353	211	167	8	37.9%
Nevada	289	3,440	180	21	112	313	4,959	213	167	9	62.0%
Minnesota	752	2,622	197	19	91	306	3,910	201	160	8	36.0%
Missouri	736	3,982	216	4	16	236	4,238	157	133	4	6.4%
Alabama	417	3,117	140	16	62	219	4,177	141	111	6	47.2%
Oregon	541	2,818	153	12	45	210	3,556	142	115	5	26.8%
Kansas	310	1,720	93	7	32	132	2,234	86	69	3	33.0%
Kentucky	378	1,826	91	7	26	123	2,271	80	65	3	33.9%
Iowa	330	1,397	81	5	21	107	1,754	70	57	2	28.2%
Oklahoma	276	2,883	96	2	9	107	3,037	70	59	2	8.3%
Utah	341	1,221	67	7	32	106	1,744	68	54	3	35.9%
New Hampshire	278	940	66	7	30	104	1,401	68	54	3	43.4%
Hawaii	126	1,120	55	7	34	96	1,653	65	51	3	51.5%
Louisiana	331	1,798	76	2	7	85	1,931	55	46	1	10.3%
Arkansas	218	1,300	58	5	21	84	1,671	54	43	2	42.2%
Idaho	227	983	55	6	22	83	1,401	54	43	2	42.4%
Maine	227	751	48	6	26	79	1,210	51	41	2	57.9%
Rhode Island	251	528	45	6	28	79	954	53	41	2	73.2%
Delaware	130	864	44	6	25	74	1,238	48	38	2	68.6%
Nebraska	271	920	55	3	11	69	1,116	45	37	1	20.2%
New Mexico	118	1,073	47	3	14	64	1,322	42	34	1	30.0%
Mississippi	215	985	40	4	15	59	1,259	37	30	1	44.8%
West Virginia	115	812	40	2	7	49	960	32	27	1	26.0%
Vermont	141	324	26	3	10	39	511	25	20	1	44.8%
Montana	127	286	17	1	4	22	366	14	11	0	30.6%
Wyoming	82	195	16	1	4	22	280	14	11	1	38.8%
Alaska	46	156	15	0	1	16	173	11	9	0	9.6%
South Dakota	87	241	12	1	2	14	278	9	7	0	19.0%
North Dakota	75	154	9	0	2	11	188	7	6	0	26.5%
Total	38,306	229,490	12,811	1,013	4,682	18,507	295,841	12,425	9,685	458	

Table B-3. Economic impacts of lawncare goods retailing, by state, 2002.

State	Reported Employment for Lawn & Garden Stores (2002)	Estimated Lawncare Sales Gross Margin (Mn$)	Direct Output Impacts (Mn$)	Indirect Output Impacts (Mn$)	Induced Output Impacts (Mn$)	Total Output Impacts (Mn$)	Employ ment Impacts (jobs)	Value Added Impacts ($Mn)	Labor Income Impacts ($Mn)	Indirect Business Tax Impacts ($Mn)
California 14,935		294.3	294.3	87.6	416.0	797.9	9,370	525.2	358.3	60.5
Texas 12,839		253.0	253.0	69.6	322.8	645.4	8,270	412.7	276.2	51.3
Illinois 7,865		155.0	155.0	47.5	214.9	417.4	5,218	267.8	181.4	31.5
Pennsylvania 6,945		136.8	136.8	40.6	165.9	343.3	4,578	219.7	147.8	26.8
Ohio 7,296		143.8	143.8	38.1	136.9	318.7	4,515	203.2	137.1	25.0
Florida 5,986		117.9	117.9	34.1	154.6	306.6	4,114	200.0	134.4	23.9
New York	6,708	132.2	132.2	37.4	131.3	300.9	3,666	201.6	136.4	24.9
Missouri 5,882		115.9	115.9	33.3	141.1	290.3	4,055	185.4	124.5	22.7
Virginia 5,651		111.3	111.3	29.9	135.1	276.3	3,781	182.3	124.8	21.2
Wisconsin 6,068		119.6	119.6	29.4	123.5	272.4	3,861	173.5	117.6	21.8
Georgia 5,276		104.0	104.0	28.8	135.4	268.2	3,333	176.2	118.6	21.2
Michigan 5,587		110.1	110.1	28.7	119.2	258.0	3,332	165.4	20.4	20.4
Minnesota 4,924		97.0	97.0	28.7	127.2	252.9	3,352	161.2	109.1	19.4
Indiana 5,571		109.8	109.8	26.8	113.1	249.7	3,568	157.4	105.3	20.2
North Carolina	5,397	106.3	106.3	24.4	115.7	246.5	3,487	159.1	107.4	19.9
Tennessee 4,797		94.5	94.5	23.8	107.0	225.3	3,071	143.8	95.7	17.9
Washington 4,798		94.5	94.5	22.9	95.6	213.1	2,742	139.5	94.7	17.4
Iowa 4,423		87.2	87.2	18.3	79.4	184.9	2,797	117.4	78.8	15.4
Colorado 3,211		63.3	63.3	18.2	89.6	171.0	2,132	111.7	76.1	13.1
Maryland 3,126		61.6	61.6	15.7	84.3	161.6	2,082	109.2	75.6	12.1
Kentucky 3,916		77.2	77.2	16.0	64.1	157.2	2,348	100.2	67.4	13.3
Oregon 3,260		64.2	64.2	18.0	68.1	150.3	2,113	97.8	65.9	12.1
New Jersey	3,158	62.2	62.2	17.3	64.7	144.2	1,653	96.7	65.9	11.8
Kansas 3,096		61.0	61.0	15.0	63.8	139.8	2,092	88.1	59.2	11.2
Nebraska 2,946		58.0	58.0	14.1	61.4	133.5	2,087	84.6	57.5	10.5
Louisiana 2,779		54.8	54.8	12.9	53.9	121.6	1,879	78.1	53.0	9.8
Massachusetts 2,503		49.3	49.3	13.3	58.3	121.0	1,390	80.8	55.4	9.6
Oklahoma 2,557		50.4	50.4	12.6	55.9	119.0	1,862	75.3	50.6	9.3
Arizona 2,453		48.3	48.3	13.0	56.4	117.7	1,612	77.1	52.2	9.2
Connecticut 2,356		46.4	46.4	12.4	48.8	107.6	1,233	72.7	49.7	8.8
South Carolina	2,302	45.4	45.4	9.0	42.4	96.8	1,427	63.0	40.9	8.1
Idaho 2,190		43.2	43.2	9.7	41.0	93.9	1,390	61.2	41.5	7.8
Arkansas 2,236		44.1	44.1	9.6	37.2	90.9	1,488	57.1	38.3	7.6
Mississippi 2,251		44.4	44.4	8.8	37.5	90.6	1,472	57.5	38.9	7.5
Alabama 2,078		40.9	40.9	8.8	38.6	88.3	1,329	56.8	38.2	7.2
Utah 1,419		28.0	28.0	7.8	37.6	73.3	1,072	46.9	32.0	5.5
South Dakota	1,502	29.6	29.6	5.6	27.3	62.4	1,029	39.4	26.7	5.1
Montana 1,338		26.4	26.4	4.6	22.2	53.1	887	33.9	23.0	4.4
New Hampshire	899	17.7	17.7	4.1	19.0	40.8	523	26.5	18.1	3.3
Nevada 926		18.2	18.2	4.0	18.1	40.4	503	26.9	18.4	3.4
New Mexico	907	17.9	17.9	4.3	17.9	40.0	631	26.2	17.9	3.2
North Dakota	975	19.2	19.2	3.7	14.7	37.6	631	23.8	16.3	3.1
Maine 802		15.8	15.8	3.0	14.8	33.5	524	21.8	15.0	2.8
West Virginia	829	16.3	16.3	2.9	11.3	30.5	505	19.5	13.2	2.7
Vermont 616		12.1	12.1	2.7	11.4	26.2	398	17.2	11.7	2.1
Delaware 500		9.9	9.9	1.9	8.3	20.1	271	13.1	8.9	1.7
Hawaii 326		6.4	6.4	1.5	7.6	15.5	216	10.6	7.3	1.2
Wyoming 375		7.4	7.4	1.4	5.5	14.3	233	9.3	6.2	1.3
Alaska 175		3.4	3.4	0.7	2.8	7.0	96	4.7	3.3	0.6
Rhode Island	150	3.0	3.0	0.5	2.5	5.9	80	4.0	2.7	0.5
Total 179,105		3,529.1	3,529.1	922.9	4,021.8	8,473.7	114,294	5, 483.1	3,615.3	671.2

Table B-4. Economic impacts of lawn equipment manufacturing, by state, 2002.

State	Lawn & Garden Equip. Manuf Establish -ments	Direct Employment in Lawn & Garden Equip. Manuf. (jobs)	Lawncare Eqmt. Direct Output ($Mn)*	Indirect Output Impacts (Mn$)	Induced Output Impacts (Mn$)	Total Output Impacts (Mn$)	Employment Impacts (jobs)	Value Added Impacts ($Mn)*	Labor Income Impacts ($Mn)*	Indirect Business Tax Impacts ($Mn)*	Export Share
Wisconsin 8		3,750	874.3	119.5	161.5	1,155.4	5,383	443.9	234.2	22.1	29.7%
Tennessee 8		3,602	839.8	113.5	140.5	1,093.9	5,313	354.0	187.8	19.6	27.8%
South Carolina	3	3,750	874.3	101.5	108.6	1,084.5	5,211	318.8	193.1	16.2	27.6%
Georgia 7		1,750	408.0	44.0	60.0	512.1	2,409	155.1	82.8	8.7	22.1%
Arkansas 3		1,750	408.0	47.7	42.2	497.9	2,511	122.6	65.0	6.8	28.7%
Ohio 9		1,750	408.0	37.4	43.6	489.1	2,117	152.1	78.5	6.1	23.0%
Illinois 7		1,750	408.0	23.2	32.4	463.6	1,819	140.4	70.4	6.3	9.5%
Indiana 12		924	215.4	20.7	21.5	257.6	1,133	74.9	38.5	3.6	17.9%
Minnesota 6		750	174.9	17.3	29.7	221.8	1,037	75.1	40.0	4.1	24.6%
Mississippi 3		750	174.9	20.0	18.5	213.4	1,023	59.6	31.0	3.0	26.8%
Arizona 3		750	174.9	11.4	18.1	204.4	892	62.3	31.9	3.0	18.1%
Missouri 4		750	174.9	9.0	10.6	194.5	815	49.6	25.0	2.2	9.5%
New York	3	750	174.9	8.5	9.0	192.3	722	55.7	27.5	2.4	9.5%
Virginia 1		750	174.9	5.9	9.5	190.3	741	53.6	26.0	2.2	9.5%
California 8		702	163.7	6.6	11.7	182.0	693	56.2	28.0	2.5	9.5%
Michigan 6		634	147.8	5.5	9.3	162.7	522	65.2	2.5	2.5	9.5%
Kansas 5		375	87.4	7.3	10.6	105.3	475	34.4	16.7	1.8	23.4%
North Carolina	3	375	87.4	3.5	5.1	96.0	355	31.6	15.4	1.3	9.5%
Pennsylvania 10		175	40.8	1.8	2.7	45.3	166	15.3	7.4	0.6	9.5%
Iowa 1		60	14.0	3.5	3.6	21.2	124	7.1	3.9	0.5	56.8%
Nebraska 2		60	14.0	1.5	2.3	17.7	87	6.2	3.2	0.3	29.6%
Florida 5		62	14.5	0.5	0.8	15.8	67	3.7	1.9	0.2	9.5%
Oklahoma 1		60	14.0	0.6	0.7	15.3	61	4.4	2.1	0.2	9.5%
Alabama 3		60	14.0	0.6	0.7	15.2	59	4.3	2.1	0.2	9.5%
New Jersey	3	60	14.0	0.5	0.7	15.2	54	4.8	2.4	0.2	9.5%
Oregon 1		60	14.0	0.5	0.7	15.2	62	4.0	2.0	0.2	9.5%
Texas 5		35	8.2	0.4	0.5	9.0	38	2.2	1.1	0.1	9.5%
Washington 4		19	4.4	0.1	0.2	4.8	17	1.5	0.6	0.1	9.5%
South Dakota	2	10	2.3	0.1	0.2	2.7	11	0.9	0.5	0.0	19.0%
Colorado 1		10	2.3	0.1	0.2	2.6	11	0.7	0.3	0.0	9.5%
Maryland 1		10	2.3	0.1	0.2	2.6	10	0.8	0.4	0.0	9.5%
Utah 2		10	2.3	0.1	0.2	2.6	11	0.8	0.4	0.0	9.5%
Louisiana 1		10	2.3	0.1	0.1	2.5	10	0.7	0.3	0.0	9.5%
Maine 2		10	2.3	0.1	0.1	2.5	10	0.7	0.3	0.0	9.5%
North Dakota	1	10	2.3	0.1	0.1	2.5	9	0.7	0.3	0.0	9.5%
Vermont 1		10	2.3	0.1	0.1	2.5	10	0.8	0.4	0.0	11.3%
Kentucky 3		7	1.6	0.1	0.1	1.8	7	0.5	0.2	0.0	9.5%
Total 150		26,370	6,148	613.4	756.6	7,513.7	33,995	2,364.7	1,224.3	117.3	

Table B-5. Economic impacts of golf courses, by state, 2002. States listed by total output impact in descending order.

State	Establishments	Direct Employment (jobs)	Annual Wages ($Mn)	Output ($Mn)	Indirect Output Impacts (Mn$)	Induced Output Impacts (Mn$)	Total Output Impacts (Mn$)	Employment Impacts (jobs)	Value Added Impacts ($Mn)	Labor Income Impacts ($Mn)	Indirect Business Tax Impacts ($Mn)	Export Share
Florida	587	32,861	589.5	1,554.9	325.1	1,208.3	3,088.2	50,938	1,926.5	1,207.6	158.4	64.8%
California	689	37,077	749.9	1,978.0	102.3	378.2	2,458.5	41,858	1,539.9	941.7	129.6	14.9%
New York	674	11,789	395.0	1,041.8	0.0	0.0	1,041.8	11,789	653.1	388.3	56.9	0.0%
Texas	581	22,388	389.5	1,027.4	0.0	0.0	1,027.4	22,388	637.2	380.1	55.2	0.0%
Illinois	497	12,065	299.6	790.3	41.8	151.4	983.6	14,049	612.7	373.6	51.9	15.2%
Michigan	652	7,963	260.2	686.4	63.3	207.4	957.1	10,925	588.6	49.0	49.0	31.4%
Pennsylvania	612	15,960	335.9	886.1	0.0	0.0	886.1	15,960	548.8	327.9	47.4	0.0%
Ohio	646	13,383	293.6	774.5	0.0	0.0	774.5	13,383	482.3	287.0	41.9	0.0%
North Carolina	456	13,362	243.5	642.2	0.0	0.0	642.2	13,362	398.0	238.0	34.4	0.0%
South Carolina	284	9,349	143.5	378.6	41.1	145.3	565.0	11,777	349.4	209.3	29.2	45.9%
New Jersey	235	7,231	210.4	554.8	0.0	0.0	554.8	7,231	349.2	207.1	30.5	0.0%
Massachusetts	326	6,576	207.7	547.8	0.0	0.0	547.8	6,576	342.0	204.2	29.6	0.0%
Arizona	196	9,618	158.7	418.5	27.7	98.6	544.7	11,120	339.3	207.3	28.5	22.5%
Georgia	279	10,534	198.8	524.4	0.0	0.0	524.4	10,534	325.2	194.5	28.1	0.0%
Indiana	334	5,324	109.2	288.0	50.4	175.4	513.7	8,053	311.8	192.2	26.4	66.4%
Missouri	262	5,339	107.1	282.5	45.2	155.6	483.4	7,799	296.8	184.1	24.7	50.2%
Colorado	125	2,987	82.4	217.4	43.8	168.1	429.2	5,320	267.3	169.3	21.8	59.9%
Virginia	245	8,440	156.8	413.6	0.0	0.0	413.6	8,440	256.1	152.8	22.2	0.0%
Nevada	62	3,348	70.1	184.8	39.7	144.3	368.9	5,379	231.9	146.9	18.8	84.5%
Maryland	142	5,896	138.1	364.2	0.0	0.0	364.2	5,896	225.9	135.2	19.5	0.0%
Wisconsin	393	5,915	134.7	355.4	0.0	0.0	355.4	5,915	219.3	131.1	18.9	0.0%
Connecticut	157	4,257	131.0	345.5	0.0	0.0	345.5	4,257	216.6	129.2	18.8	0.0%
Minnesota	357	3,868	119.9	316.1	0.0	0.0	316.1	3,868	195.7	116.7	17.0	0.0%
Tennessee	216	5,113	97.0	255.9	12.9	45.2	313.9	5,801	195.3	117.2	16.8	17.1%
Washington	211	5,096	106.6	281.2	6.1	19.4	306.7	5,383	190.8	115.1	16.3	7.5%
Iowa	318	3,075	58.5	154.4	25.7	85.6	265.7	4,551	161.8	99.5	13.6	67.4%
Louisiana	126	3,293	54.1	142.8	27.1	93.8	263.7	4,927	162.4	101.7	13.3	73.4%
Alabama	177	4,696	79.2	208.8	11.9	38.8	259.4	5,354	159.0	96.9	13.4	22.0%
Hawaii	50	2,579	52.9	139.6	20.1	78.2	237.9	3,848	152.5	97.4	11.8	52.5%
Oregon	148	3,610	75.9	200.3	0.0	0.0	200.3	3,610	124.1	74.0	10.7	0.0%
Kentucky	198	3,528	64.3	169.6	0.0	0.0	169.6	3,528	105.1	62.7	9.1	0.0%
Mississippi	129	2,376	36.9	97.3	15.8	54.0	167.1	3,355	101.9	63.4	8.4	73.5%
Kansas	170	3,399	61.7	162.9	0.0	0.0	162.9	3,399	100.8	60.2	8.7	0.0%
Oklahoma	119	3,159	49.9	131.7	0.0	0.0	131.7	3,159	81.4	48.6	7.0	0.0%
Rhode Island	61	1,151	33.2	87.6	7.3	26.0	120.9	1,555	75.8	46.5	6.3	39.8%
Arkansas	156	2,642	43.3	114.3	0.0	0.0	114.3	2,642	70.4	42.0	6.1	0.0%
New Hampshire	84	901	34.8	91.7	4.9	16.9	113.6	1,156	70.0	42.8	5.9	19.4%
Utah	55	1,193	26.5	69.8	8.5	33.9	112.3	1,758	69.1	43.1	5.7	40.0%
Nebraska	155	2,058	39.1	103.2	0.0	0.0	103.2	2,058	64.1	38.1	5.6	0.0%
Delaware	36	1,308	29.6	78.0	0.0	0.0	78.0	1,308	48.5	29.0	4.2	0.0%
Maine	105	637	20.4	53.7	4.1	14.9	72.7	909	44.8	27.7	3.7	33.2%
Montana	76	615	16.7	44.0	6.0	21.1	71.0	1,025	43.2	26.9	3.5	61.8%
Idaho	73	1,109	23.0	60.6	2.5	7.6	70.7	1,255	43.5	27.4	3.5	14.8%
West Virginia	91	1,078	18.8	49.7	2.9	8.9	61.5	1,243	38.0	23.0	3.3	28.1%
South Dakota	71	535	12.6	33.3	4.1	15.0	52.3	804	31.7	19.6	2.7	54.9%
New Mexico	43	1,171	18.8	49.6	0.0	0.0	49.6	1,171	30.7	18.3	2.7	0.0%
Vermont	48	263	13.3	35.1	0.0	0.0	35.1	263	21.8	13.0	1.9	0.0%
Wyoming	41	402	8.5	22.6	1.4	4.0	27.9	479	17.3	10.4	1.5	26.0%
North Dakota	70	255	7.3	19.2	0.0	0.0	19.2	255	11.7	7.0	1.0	0.0%
Alaska	18	64	1.4	3.6	0.2	0.8	4.6	77	2.9	1.9	0.2	28.1%
Total	11,836	310,833	6,609.5	17,433.8	941.8	3,396.7	21,772.3	361,690	13,532.2	7,926.7	1,145.6	