

# Economic Impact of the Turfgrass Industry in New England

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Raub, K.<sup>1</sup>, B.L. Campbell<sup>1</sup>, V. Wallace<sup>2</sup>, J. Henderson<sup>3</sup>, J. Inguagiato, and S. Rackliffe<sup>3</sup>

<sup>1</sup>Department of Agricultural and Resource Economics.

<sup>2</sup>Department of Extension,

<sup>3</sup>Department of Plant Science and Landscape Architecture,  
University of Connecticut

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## **ABSTRACT**

Turfgrass is a major industry in the six states of New England: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont. The purpose of this study was to determine the regional and state specific effects of the turfgrass industry on the New England economy in terms of direct sales, employment (jobs), value added, labor, and total impacts created by these economic activities. Six primary sectors of the turfgrass industry were studied in detail: 1) sod farm production, 2) lawn equipment manufacturing, 3) lawn care services, 4) golf courses, 5) non-equipment wholesalers, and 6) lawn care retailing. Six secondary sectors were also evaluated: 1) airports, 2) roadways, 3) municipal grounds maintenance, 4) school grounds, 5) athletic fields, and 6) cemeteries. IMPLAN was used to create an input-output model that includes transactions between industries, employees, households and the government within a specific economy (Miller and Blair, 1985). Results show that the New England turfgrass industry contributed \$11.3 billion and 134,467 jobs to the regional economy, and had \$7.1 billion in value-added.

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## INTRODUCTION

Humans have used turfgrass for over 10 centuries (Beard and Green, 1994). It is estimated that two percent of U.S. land area (Milesi et al. 2005) is covered with turfgrass and in 2002 the lawn care industry was estimated at \$57.8 billion (Haydu, Hodges, and Hall 2006). There have been numerous environmental benefits attributed to the use of turfgrass including, stabilizing sediment to control erosion, improving groundwater recharge, and aiding CO<sub>2</sub> conversion (Beard and Green 1994). Turfgrass has also been shown to reduce noise pollution and it can delay, or prevent, the movement of chemicals from lawns and agricultural areas to watersheds (Blanco-Montero *et al.* 1995). Further, it provides an inexpensive surface for sports/outdoor activities and helps cushion against personal impact injuries (Beard and Green 1994), while also improving mental health and work productivity due to its' aesthetics (Beard and Green, 1994).

Given the numerous benefits, it is essential to understand the structure and impact of the growing turfgrass industry. The industry can be broken into two main sectors, 1) suppliers and 2) consumers of turf products and services. Suppliers include sod and seed producers, manufacturers, wholesalers, and retailers. Consumers, on the other hand, include golf courses, athletic fields, commercial institutions, non-profits, municipal properties and households.

The economic significance of specialty crops, including turfgrass, has grown considerably over the past 20+ years (Haydu et al. 2008). While over 60 state level studies have been performed on nursery crops and turfgrass between 1978 and 2004 (Haydu et al. 2008), the most recent study of the industry was done approximately ten years ago and only four studies have included, or specifically concentrated on, New England. These studies have focused on five primary sectors- sod production, lawn care services, lawn equipment manufacturing, golf courses, and retail sales- and three secondary sectors- cemeteries, airports, and school grounds. This study takes a more in-depth approach and includes six primary sectors and six secondary sectors: sod production, lawn care services, lawn equipment manufacturing, golf courses, retail, and lawn care wholesaling (i.e., equipment); and cemeteries, airports, school grounds, athletic fields, roadways, and municipal.

## RESEARCH METHODOLOGY

IMPLAN was used to generate an input-output model that accounts for transactions between industries, employees, households, and government within a specified economy (Miller and Blair 1985). The IMPLAN sectors correspond to the North American Industrial Classification System (NAICS), which classify industries based on the dominant good or service produced (Haydu et al. 2008). Table 1 details the IMPLAN sectors, and corresponding NAICS codes, included in this study. As we are using the latest version of IMPLAN (version 3 with 2012 data) we list the older corresponding IMPLAN sector codes used in previous studies.

**Table 1.** Industry Sectors, Information Sources, Economic Impact Analysis.

| Sector                       | NAICS  |              | IMPLAN                                      |      |     |
|------------------------------|--|--------------|---|------|-----|
|                              | Industry Sector Description  | Code         | Industry Sector Description                 | Code |     |
|                              |  |              |   | Old  | New |
| Sod Farms                    | Nursery and floriculture production                                      | 11142        | Nursery & Greenhouse                        | 6    | 6   |
| Lawn care services           | Landscaping services   | 56173        | Services to buildings and dwellings         | 458  | 388 |
| Lawn care retail stores      | Lawn and garden equipment and supplies stores (1) and home centers (2)   | 4442 & 44411 | Building material and garden supply stores  | 404  | 323 |
| Lawn equipment manufacturing | Lawn and garden tractor and home lawn and garden equipment manufacturing | 333112       | Lawn & garden equipment manufacturing       | 258  | 204 |
| Golf Courses                 | Golf courses and country clubs   | 71391        | Amusement, gambling and recreation services | 458  | 410 |
| Cemeteries                   | Cemeteries and crematories   | 812220       | Death care services                         | N/A  | 420 |
| Lawn equipment wholesaling   | Merchant wholesalers of specialized machinery, equipment, and parts      | 423820       | Wholesale trade businesses                  | N/A  | 319 |

IMPLAN derives economic multipliers to estimate the total economic impact of each turfgrass industry sector in a user specified area (Haydu et al. 2008). Direct, indirect, and induced effect multipliers for output, employment and value added are provided per sector in Appendix A.

- *Direct Effects:* Direct sales by industry firms.
- *Indirect Effects:* Effects of intermediate purchases by industry firms from other economic sectors.
- *Induced Effects:* Effects of industry employee household consumer spending.
- *Output:* Total impact generated.
- *Employment:* Jobs (full and part time) created by a sector.
- *Value Added:* Total personal and business net income (Haydu, Hodges and Hall, 2006).

Value-added is the most accurate estimate of the turfgrass industries impact to the regional economy because it represents the net impact after direct effects have been subtracted (Haydu et al. 2008).

Primary data was collected from a variety of sources and inputted into IMPLAN to run a regional analysis of New England. Data sources are detailed below:<sup>1</sup>

- *Sod production*: 2012 Agricultural Census (USDA-National Agricultural Statistics Service)
- *Lawn equipment manufacturing*: U.S. Census Bureau 2012 Manufacturing and Industry Series<sup>2</sup>
- *Lawn equipment wholesaling*: IBIS Word Reports<sup>3</sup>
- *Landscape services*: 2012 U.S. Census Bureau Economic Census – sales per firm were estimated by dividing U.S. value of sales by number of U.S. firms as state level data was not available.<sup>4</sup> State firm numbers were from the 2012 U.S. Census Bureau County Business Patterns. Subsectors within landscape services were found by calculating the percentage of firms out of all firms in the U.S. participating in a specific activity, such as commercial landscaping, residential landscaping, landscape architectural and design services, or landscape construction services, and then multiplying by the number of firms in each state. Calculations do not contain snow removal related activities.
- *Golf*: Number of firms for each state were from a 2011 AARP report. Value per firm was from the 2007 U.S. Census Bureau Economic Census and adjusted to real dollars. Values only include memberships and green fees associated with playing golf and do not include other amenities at country clubs, such as food/beverage sales. Equipment apparel and equipment sales were estimated from reports by Bloomberg and Statista. Turf related expenditures were from the GCSAA 2012 Maintenance Budget Survey.
- *Municipalities*: Data came from examining budgets from 5-7 towns/cities per state, including the largest towns/cities and multiplying the total number of towns/cities.
- *Cemeteries*: Number of cemeteries came from expertgps.com with average cemetery size received from personal communications with state/regional cemetery association members.
- *Roadways*: Total road miles per state were from the Department of Transportation with expenditure per mile from a variety of state reports.
- *Airports*: Total number of airports per state were from the Department of Transportation with acres and per acre expenditures from a variety of state and governmental reports.
- *School athletic fields*: Number of fields per sport by state were from maxpreps.com, including football, baseball, soccer, lacrosse, and softball.
- *School grounds*: Number of schools was taken from [www.educationbug.org](http://www.educationbug.org) with average area being eleven acres.
- *Retailing*: 2010 National Gardening Survey

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<sup>1</sup> More details about the report and specific data sources are available from the report authors.

<sup>2</sup> The number of firms per state was available in 2012 but sales were not available by state. The per state sales was calculated by estimating the U.S. average per firm (which was available) and then multiplying the average by the number of firms per state.

<sup>3</sup> <http://clients1.ibisworld.com/reports/us/industry/productsandmarkets.aspx?entid=947>

<sup>4</sup> The estimated value per firm is similar to that obtained from the Dunn and Bradstreet report.

## RESULTS

The results are presented as totals for all of New England with percentage breakdowns per New England state. The results are impacts associated with a sectors/sub-sectors impact on the New England economy, not just on the state economy. However, impacts outside the state are minimal for all sectors/sub-sectors.

### STATE BY STATE IMPACTS

#### NEW ENGLAND IMPACT – TOTAL

The turfgrass industry contributes to over 134,000 jobs with direct sales of \$10.7 billion (Table 2). Furthermore, there was approximately \$11.3 billion in economic activity attributable to the industry in 2012. Labor earned income was around \$5 billion while valued added was at \$7.1 billion. In total, the direct output for the turfgrass sector was \$6.8 billion in economic activity with another \$1.7 billion and \$2.8 billion coming from the indirect (i.e. intermediate firm purchases) and induced (i.e. employee household spending). To put the numbers in perspective, this equates to \$777 dollars of output per New England resident. In real dollar terms, the turfgrass industry would have direct sales around \$11 billion with a total economic impact of \$11.7 billion in 2014 dollars.

**Table 2.** Turfgrass Industry Total Impacts for New England.

|          | Total Direct Sales (dollars in millions) | Total Employment (jobs) | Total Labor Income (dollars in millions) | Total Value Added (dollars in millions) | Total Output (dollars in millions) |
|----------|--|-------------------------|--|---|------------------------------------|
| Direct   | 10,672                                   | 100,468                 | 3,232                                    | 4,172                                   | 6,844                              |
| Indirect |  | 12,403                  | 705                                      | 1,108                                   | 1,694                              |
| Induced  |  | 21,595                  | 1,074                                    | 1,822                                   | 2,770                              |
| Total    |  | 134,467                 | 5,011                                    | 7,102                                   | 11,308                             |

When examining sector specific impacts it is apparent that lawn care services is an extremely important driver of the turfgrass industry (Table 3). Lawn care services had direct sales of over \$4 billion with a total impact of \$6.7 billion. Within lawn care services, commercial maintenance contributes over half of direct sales, total output, and employment. Golf has a \$2.5 billion dollar impact on the New England regional economy contributing almost 35,000 jobs. The golf impact is not the true impact of golf in that this report only looked at facets of the game directly related to turf. For instance, we include green fees and club memberships as well as equipment and apparel sales. We do not include food/drink sales at country clubs, charitable giving by golf organizations, or other similar activities.

Table 3. Impacts by Sector for the New England Region.

| Sector  | Direct Sales<br>(dollars) | Indirect<br>(dollars) | Induced<br>(dollars) | Labor Income<br>(dollars) | Value Added<br>(dollars) | Total Output<br>(dollars) | Employment<br>(jobs) |
|---|---------------------------|-----------------------|----------------------|---------------------------|--------------------------|---------------------------|----------------------|
| Sod Production  | 26,297,304                | 3,969,041             | 8,180,826            | 14,527,027                | 24,886,928               | 38,445,627                | 460.2                |
| Lawn Equipment Manufacturing                                    | 20,866,953                | 4,377,012             | 2,712,197            | 4,796,852                 | 9,157,091                | 27,956,162                | 96.9                 |
| Lawn care Wholesaling   | 2,570,616,400             | 112,054,202           | 159,342,298          | 285,231,891               | 472,760,703              | 718,683,742               | 4,286.1              |
| Lawn care Service – Total                                       | 4,117,108,889             | 958,346,375           | 1,627,377,000        | 2,947,346,316             | 4,023,176,971            | 6,702,832,264             | 82,085.8             |
| Lawn care Service – Residential                                 | 1,334,822,253             | 281,995,342           | 534,019,974          | 966,461,139               | 1,316,689,733            | 2,150,837,569             | 28,738.2             |
| Lawn care Service – Commercial                                  | 2,186,268,615             | 461,872,404           | 874,656,612          | 1,582,940,088             | 2,156,569,860            | 3,522,797,630             | 47,069.7             |
| Lawn care Service – Landscape Architectural and Design Services | 36,672,954                | 12,107,954            | 19,991,687           | 36,183,917                | 44,299,190               | 68,772,597                | 569.7                |
| Lawn care Service – Landscape Construction                      | 559,345,066               | 202,370,675           | 198,708,727          | 361,761,172               | 505,618,188              | 960,424,468               | 5,708.2              |
| Golf Course - Total   | 1,600,457,413             | 404,250,963           | 634,881,398          | 1,149,585,910             | 1,668,292,008            | 2,500,567,492             | 34,458.8             |
| Golf Course – Playing   | 1,367,198,548             | 371,801,865           | 593,979,576          | 1,075,635,041             | 1,560,218,763            | 2,332,979,988             | 31,884.1             |
| Golf Course – Apparel and Equipment                             | 233,258,864               | 32,449,098            | 40,901,822           | 73,950,869                | 108,073,245              | 167,587,504               | 2,574.7              |
| Lawn care Retailing   | 2,235,108,706             | 206,619,344           | 331,330,794          | 598,103,836               | 884,683,910              | 1,291,181,800             | 12,913.8             |
| Other Wholesaling Activities <sup>a</sup>                       | 101,837,616               | 4,533,256             | 6,451,738            | 11,559,945                | 19,238,155               | 28,704,738                | 165.2                |

Table 3 Cont'd. Impacts by Sector for the New England Region.

|                                 |                |               |               |               |               |                |           |
|---------------------------------|----------------|---------------|---------------|---------------|---------------|----------------|-----------|
| Municipal – Grounds Maintenance | 56,003,112     | 2,499,891     | 3,517,714     | 6,287,898     | 10,515,682    | 15,762,146     | 91.6      |
| Airports                        | 1,300,629      | 57,400        | 80,229        | 141,910       | 237,226       | 363,940        | 2.3       |
| Roadways                        | 2,834,621      | 125,115       | 178,547       | 318,820       | 528,467       | 796,887        | 4.7       |
| Fields                          | 12,521,109     | 556,539       | 804,123       | 1,444,668     | 2,386,311     | 3,539,335      | 20.1      |
| School Grounds                  | 10,270,352     | 455,185       | 655,174       | 1,176,714     | 1,945,795     | 2,897,399      | 16.5      |
| Cemetery                        | 18,907,792     | 839,126       | 1,215,951     | 2,189,935     | 3,624,674     | 5,345,031      | 30.0      |
| Golf Course - Upkeep            | 330,592,748    | 14,639,807    | 21,147,706    | 37,871,614    | 62,563,964    | 93,310,651     | 536.1     |
| Total                           | 10,672,293,281 | 1,694,150,193 | 2,770,276,251 | 5,011,151,777 | 7,102,195,766 | 11,308,371,825 | 134,466.8 |

<sup>a</sup> The categories in other wholesaling activities do not include labor expenses or contracted expenses, even though these are considerable for all sectors listed. The values presented are only for inputs to turfgrass.

Examining the total impacts at the state level, MA has the largest turfgrass industry with direct sales almost double that of CT, the state with the second largest turfgrass industry (Table 4). MA has direct sales of \$4.3 billion with an economic output of almost \$5 billion. Over 57,000 MA jobs can be attributed to turf. On the other end of the spectrum Rhode Island generated \$609 million in total output with only 7,430 turf jobs. However, to put these numbers in perspective, Vermont had the highest total output to resident value with \$973 output generated per resident, while Maine had the lowest per resident output at \$690 per resident. A major factor in the economic impacts by state and per resident totals is the type of industry and its value (see multipliers in Appendices A1-A7) to the state. For instance, some sectors provide a larger output per dollar and/or jobs per dollar than other sectors. Revenue from playing golf (i.e. green fees, memberships, etc.) in MA generates the largest impact per dollar of sales at \$1.74. However, NH generates the highest employment per million dollars of sales at 27.35. MA, on the other hand, generates 24.5 jobs per million dollars in sales. This implies that impacts by state are a function of the size of a sector as well as the value generated by the sector throughout the region.

**Table 4.** Turfgrass Industry Total Output per State.

| State         | Direct Sales<br>(dollars in<br>millions) | Total<br>Employment | Total Labor<br>Income<br>(dollars in<br>millions) | Total Value<br>Added<br>(dollars in<br>millions) | Total Output<br>(dollars in<br>millions) |
|---------------|--|---------------------|---|--|--|
| CT            | 2,473                                    | 33,536              | 1,312   | 1,813  | 2,853                                    |
| ME            | 1,067                                    | 11,781              | 363   | 547  | 918                                      |
| MA            | 4,270                                    | 57,620              | 2,273   | 3,157  | 4,976                                    |
| NH            | 1,164                                    | 13,846              | 468   | 689  | 1,098                                    |
| RI            | 772                                      | 10,253              | 372   | 541  | 855                                      |
| VT            | 928                                      | 7,430               | 223   | 356  | 609                                      |
| All<br>States | 10,672                                   | 134,467             | 5,011   | 7,102  | 11,308                                   |

## STATE IMPACTS

### CONNECTICUT

The turfgrass industry in Connecticut contributes over 33,000 jobs with direct sales of \$2.5 billion (Table 5). Further, there is around \$2.9 billion in economic activity attributable to the industry. The largest sector is lawn care services with \$1 billion in direct sales and \$1.7 billion in economic activity generated. The lawn care services sector also contributes 61% of the jobs within the CT turfgrass industry. Commercial maintenance is the largest sub-sector within lawn

care services contributing almost 12,000 of the 20,000 jobs and over half of the economic output for the sector. Lawn care retailing is the second largest with respect to direct sales but is third, after golf, with respect to economic activity.

#### MAINE

The turfgrass industry in Maine contributes almost 12,000 jobs with direct sales of \$1.1 billion (Table 6). Total economic output generated was \$918 million with value added output at \$547 million. The largest sector with respect to direct sales was lawn care wholesaling, however, lawn care services had the highest total output at \$544 million.

#### MASSACHUSETTS

The turfgrass industry in Massachusetts has the largest turfgrass sector in New England with almost \$5 billion in total output and employing over 57,000 people (Table 7). Turfgrass in Massachusetts is led by lawn care services followed by golf and lawn care retailing. With respect to golf numbers provided in this report, total output numbers are similar to those found in the 2012 Massachusetts Golf Economy Full Report (SRI International 2014).

#### NEW HAMPSHIRE

The turfgrass industry in New Hampshire has \$1.2 billion in direct sales with a total economic output of \$1.1 billion. Due to the nature of the NH turfgrass industry, direct sales flow out of the region leading to lower economic output than direct sales. Further, the industry contributes 13,846 jobs (Table 8). The value added impact is \$689 million with labor income of \$468 million. The largest sector in terms of direct sales was lawn care services with \$410 million in direct sales followed closely by lawn care wholesaling at \$406 million. However, lawn care services contributed almost six times the regional total impact as lawn care wholesaling, \$646 million to \$117 million, respectively.

#### RHODE ISLAND

The turfgrass industry in Rhode Island contributes over 10,000 jobs with direct sales of \$772 million (Table 9). Further, there is around \$855 million in economic activity attributable to the industry. The largest sector is lawn care services with \$321 million in direct sales and \$514 million in economic activity generated. Further, turfgrass production in Rhode Island is the largest of any New England state with respect to direct sales and economic impact. Production of turfgrass contributes \$17 million to the regional economy and employs 222 people.

#### VERMONT

The turfgrass industry in Vermont contributes to over 7,000 jobs with direct sales of \$928 million with total output around \$609 million (Table 10). Vermont and Connecticut are the only two states in New England that currently have lawn equipment manufacturing. With respect to Vermont, lawn equipment manufacturing contributes over \$17 million to the regional economy. Further, the largest sector in Vermont turfgrass is lawn care wholesaling, but lawn care services has the largest total output.

Table 5. Impacts by Sector for Connecticut.

| Sector  | Direct Sales  | Indirect    | Induced     | Labor Income | Value Added   | Output        | Employment |
|---|---------------|-------------|-------------|--------------|---------------|---------------|------------|
| Sod Production  | 6,106,160     | 1,048,999   | 2,075,378   | 3,983,477    | 6,004,548     | 9,230,537     | 96.9       |
| Lawn Equipment Manufacturing                                    | 7,825,108     | 1,839,002   | 1,207,407   | 2,292,114    | 4,871,008     | 10,871,517    | 33.0       |
| Lawn care Wholesaling   | 405,886,800   | 18,512,685  | 25,759,953  | 49,042,112   | 80,169,021    | 114,896,940   | 610.2      |
| Lawn care Service – Total                                       | 1,032,477,048 | 256,441,398 | 400,725,494 | 767,773,909  | 1,023,302,135 | 1,689,643,940 | 20,502.8   |
| Lawn care Service – Residential                                 | 334,742,990   | 77,161,517  | 130,176,115 | 249,045,329  | 333,754,893   | 542,080,622   | 7,180.3    |
| Lawn care Service – Commercial                                  | 548,266,326   | 126,380,723 | 213,211,875 | 407,904,488  | 546,647,949   | 887,858,924   | 11,760.5   |
| Lawn care Service – Landscape Architectural and Design Services | 9,196,741     | 3,322,892   | 4,816,513   | 9,221,709    | 11,187,813    | 17,336,146    | 143.0      |
| Lawn care Service – Landscape Construction                      | 140,270,991   | 49,576,266  | 52,520,991  | 101,602,383  | 131,711,480   | 242,368,248   | 1,419.0    |
| Golf Course - Total   | 443,901,545   | 115,749,632 | 176,574,288 | 334,947,104  | 473,360,485   | 701,950,358   | 9,178.3    |
| Golf Course – Playing   | 386,392,976   | 106,287,102 | 166,715,812 | 316,127,142  | 446,805,876   | 659,395,890   | 8,550.5    |
| Golf Course – Apparel and Equipment                             | 57,508,569    | 9,462,530   | 9,858,476   | 18,819,962   | 26,554,609    | 42,554,468    | 627.8      |
| Lawn care Retailing   | 551,052,596   | 54,710,809  | 79,093,477  | 150,631,470  | 219,797,514   | 319,509,018   | 3,077.2    |
| Other Wholesaling Activities <sup>a</sup>                       | 25,213,991    | 1,150,021   | 1,600,226   | 3,046,532    | 4,980,159     | 7,137,481     | 38.0       |

Table 5 Cont'd. Impacts by Sector for Connecticut.

|                                 |               |             |             |               |               |               |          |
|---------------------------------|---------------|-------------|-------------|---------------|---------------|---------------|----------|
| Municipal – Grounds Maintenance | 15,481,714    | 706,128     | 982,560     | 1,870,610     | 3,057,882     | 4,382,506     | 23.3     |
| Airports                        | 181,732       | 8,289       | 11,534      | 21,958        | 35,895        | 51,444        | 0.3      |
| Roadways                        | 517,467       | 23,602      | 32,841      | 62,524        | 102,208       | 146,482       | 0.8      |
| Fields                          | 2,862,904     | 130,578     | 181,696     | 345,916       | 565,468       | 810,420       | 4.3      |
| School Grounds                  | 2,322,585     | 105,934     | 147,405     | 280,631       | 458,747       | 657,468       | 3.5      |
| Cemetery                        | 3,847,589     | 175,490     | 244,190     | 464,893       | 759,959       | 1,089,161     | 5.8      |
| Golf Course - Upkeep            | 63,003,757    | 2,873,630   | 3,998,587   | 7,612,559     | 12,444,232    | 17,834,871    | 94.7     |
| Total                           | 2,472,463,247 | 449,452,546 | 687,036,223 | 1,311,716,718 | 1,812,484,870 | 2,853,239,791 | 33,536.4 |

<sup>a</sup> The categories in other wholesaling activities do not include labor expenses or contracted expenses, even though these are considerable for all sectors listed. The values presented are only for inputs to turfgrass.

Table 6. Impacts by Sector for Maine.

| Sector  | Direct Sales | Indirect   | Induced     | Labor Income | Value Added | Output      | Employment |
|---|--------------|------------|-------------|--------------|-------------|-------------|------------|
| Sod Production  | 5,094,869    | 737,603    | 2,731,950   | 4,578,242    | 5,496,025   | 8,564,422   | 89.6       |
| Lawn Equipment Manufacturing                                    | -            | -          | -           | -            | -           | -           | -          |
| Lawn care Wholesaling   | 405,886,800  | 18,803,601 | 24,231,445  | 40,302,250   | 70,864,343  | 113,659,347 | 753.7      |
| Lawn care Service – Total                                       | 340,781,422  | 76,994,480 | 126,195,286 | 210,683,499  | 302,617,300 | 543,971,190 | 7,565.1    |
| Lawn care Service – Residential                                 | 110,485,935  | 22,133,536 | 42,339,888  | 70,678,939   | 99,899,964  | 174,959,360 | 2,655.6    |
| Lawn care Service – Commercial                                  | 180,961,871  | 36,251,910 | 69,347,338  | 115,763,088  | 163,623,402 | 286,561,119 | 4,349.6    |
| Lawn care Service – Landscape Architectural and Design Services | 3,035,495    | 918,776    | 1,600,028   | 2,670,611    | 3,343,653   | 5,554,299   | 52.9       |
| Lawn care Service – Landscape Construction                      | 46,298,121   | 17,690,258 | 12,908,032  | 21,570,861   | 35,750,281  | 76,896,412  | 507.0      |
| Golf Course - Total   | 92,164,674   | 18,288,620 | 33,673,254  | 56,155,748   | 87,056,463  | 131,437,468 | 2,065.0    |
| Golf Course – Playing   | 70,874,272   | 16,285,317 | 30,213,614  | 50,382,521   | 77,505,004  | 117,373,203 | 1,802.9    |
| Golf Course – Apparel and Equipment                             | 21,290,402   | 2,003,303  | 3,459,640   | 5,773,227    | 9,551,459   | 14,064,265  | 262.1      |
| Lawn care Retailing   | 204,006,661  | 16,057,061 | 29,659,665  | 49,478,123   | 77,628,489  | 114,466,973 | 1,271.2    |
| Other Wholesaling Activities <sup>a</sup>                       | 19,356,455   | 896,730    | 1,155,579   | 1,921,985    | 3,379,469   | 5,420,333   | 36.0       |

Table 6 Cont'd. Impacts by Sector for Maine.

|                                 |               |             |             |             |             |             |          |
|---------------------------------|---------------|-------------|-------------|-------------|-------------|-------------|----------|
| Municipal – Grounds Maintenance | 12,897,559    | 597,508     | 769,984     | 1,280,654   | 2,251,803   | 3,611,667   | 24.0     |
| Airports                        | 406,224       | 18,819      | 24,251      | 40,336      | 70,923      | 113,754     | 0.8      |
| Roadways                        | 551,949       | 25,570      | 32,951      | 54,805      | 96,365      | 154,561     | 1.0      |
| Fields                          | 1,773,153     | 82,145      | 105,857     | 176,064     | 309,577     | 496,531     | 3.3      |
| School Grounds                  | 1,478,808     | 68,509      | 88,285      | 146,837     | 258,187     | 414,106     | 2.7      |
| Cemetery                        | 2,248,762     | 104,179     | 134,251     | 223,289     | 392,614     | 629,714     | 4.2      |
| Golf Course - Upkeep            | 49,553,517    | 2,295,676   | 2,958,345   | 4,920,382   | 8,651,618   | 13,876,333  | 92.0     |
| Total                           | 1,067,290,881 | 131,778,095 | 217,647,179 | 363,119,847 | 547,042,089 | 917,519,733 | 11,780.6 |

<sup>a</sup> The categories in other wholesaling activities do not include labor expenses or contracted expenses, even though these are considerable for all sectors listed. The values presented are only for inputs to turfgrass.

Table 7. Impacts by Sector for Massachusetts.

| Sector  | Direct Sales  | Indirect    | Induced     | Labor Income  | Value Added   | Output        | Employment |
|---|---------------|-------------|-------------|---------------|---------------|---------------|------------|
| Sod Production  | 2,053,208     | 352,400     | 745,121     | 1,338,145     | 2,045,916     | 3,150,729     | 41.1       |
| Lawn Equipment Manufacturing                                    | -             | -           | -           | -             | -             | -             | -          |
| Lawn care Wholesaling   | 676,478,000   | 29,882,458  | 45,173,963  | 81,095,232    | 133,539,187   | 192,763,590   | 1,025.0    |
| Lawn care Service – Total                                       | 1,795,102,140 | 428,603,551 | 760,804,223 | 1,366,552,495 | 1,824,828,789 | 2,984,509,915 | 34,565.1   |
| Lawn care Service – Residential                                 | 581,996,335   | 123,181,254 | 246,296,177 | 442,502,393   | 596,702,954   | 951,473,766   | 11,994.6   |
| Lawn care Service – Commercial                                  | 953,235,772   | 201,755,184 | 403,401,726 | 724,762,485   | 977,323,338   | 1,558,392,682 | 19,645.7   |
| Lawn care Service – Landscape Architectural and Design Services | 15,989,788    | 5,228,749   | 9,324,670   | 16,751,235    | 20,321,302    | 30,543,208    | 233.0      |
| Lawn care Service – Landscape Construction                      | 243,880,245   | 98,438,364  | 101,781,650 | 182,536,382   | 230,481,195   | 444,100,259   | 2,691.8    |
| Golf Course - Total   | 742,135,506   | 207,179,060 | 302,584,660 | 543,508,936   | 780,535,102   | 1,188,452,074 | 16,219.7   |
| Golf Course – Playing   | 635,680,551   | 190,186,547 | 283,125,445 | 508,560,558   | 730,873,607   | 1,108,992,542 | 15,064.9   |
| Golf Course – Apparel and Equipment                             | 106,454,955   | 16,992,513  | 19,459,215  | 34,948,378    | 49,661,495    | 79,459,532    | 1,154.8    |
| Lawn care Retailing   | 1,020,061,543 | 99,297,720  | 154,078,290 | 276,803,117   | 409,251,913   | 597,136,763   | 5,718.1    |
| Other Wholesaling Activities <sup>a</sup>                       | 33,632,972    | 1,485,689   | 2,245,947   | 4,031,872     | 6,639,269     | 9,583,772     | 51.0       |

Table 7 Cont'd. Impacts by Sector for Massachusetts.

|                                 |               |             |               |               |               |               |          |
|---------------------------------|---------------|-------------|---------------|---------------|---------------|---------------|----------|
| Municipal – Grounds Maintenance | 12,927,317    | 571,046     | 863,262       | 1,549,708     | 2,551,899     | 3,683,661     | 19.6     |
| Airports                        | 274,379       | 12,120      | 18,322        | 32,892        | 54,163        | 78,185        | 0.4      |
| Roadways                        | 875,991       | 38,696      | 58,497        | 105,012       | 172,924       | 249,615       | 1.3      |
| Fields                          | 5,335,975     | 235,709     | 356,327       | 639,669       | 1,053,341     | 1,520,495     | 8.1      |
| School Grounds                  | 3,946,417     | 174,327     | 263,534       | 473,091       | 779,036       | 1,124,537     | 6.0      |
| Cemetery                        | 10,272,894    | 453,791     | 686,005       | 1,231,500     | 2,027,906     | 2,927,279     | 15.6     |
| Golf Course - Upkeep            | 133,440,542   | 5,894,547   | 8,910,915     | 15,996,665    | 26,341,642    | 38,024,115    | 202.2    |
| Total                           | 4,269,463,369 | 766,800,878 | 1,265,632,204 | 2,273,329,797 | 3,156,840,176 | 4,975,596,843 | 57,620.0 |

<sup>a</sup> The categories in other wholesaling activities do not include labor expenses or contracted expenses, even though these are considerable for all sectors listed. The values presented are only for inputs to turfgrass.

Table 8. Impacts by Sector for New Hampshire.

| Sector  | Direct Sales | Indirect   | Induced     | Labor Income | Value Added | Output      | Employment |
|---|--------------|------------|-------------|--------------|-------------|-------------|------------|
| Sod Production  | 301,714      | 39,513     | 89,266      | 155,770      | 280,189     | 430,494     | 7.9        |
| Lawn Equipment Manufacturing                                    | -            | -          | -           | -            | -           | -           | -          |
| Lawn care Wholesaling   | 405,886,800  | 17,729,448 | 28,246,771  | 49,274,752   | 75,920,904  | 116,600,520 | 716.4      |
| Lawn care Service – Total                                       | 409,577,672  | 85,118,925 | 151,517,050 | 265,775,802  | 390,824,529 | 646,213,645 | 8,278.2    |
| Lawn care Service – Residential                                 | 132,790,608  | 26,054,701 | 51,827,709  | 90,866,523   | 127,875,345 | 210,673,017 | 2,953.0    |
| Lawn care Service – Commercial                                  | 217,494,080  | 42,674,277 | 84,887,177  | 148,827,776  | 209,443,507 | 345,055,533 | 4,836.6    |
| Lawn care Service – Landscape Architectural and Design Services | 3,648,294    | 1,178,449  | 1,937,429   | 3,396,573    | 4,260,531   | 6,764,171   | 59.9       |
| Lawn care Service – Landscape Construction                      | 55,644,691   | 15,211,498 | 12,864,735  | 22,684,930   | 49,245,146  | 83,720,924  | 428.7      |
| Golf Course - Total   | 140,014,244  | 32,804,773 | 54,585,982  | 95,352,836   | 140,661,505 | 214,796,817 | 3,491.1    |
| Golf Course – Playing   | 118,859,575  | 30,959,996 | 50,697,876  | 88,526,857   | 130,580,569 | 200,517,447 | 3,251.4    |
| Golf Course – Apparel and Equipment                             | 21,154,669   | 1,844,777  | 3,888,106   | 6,825,979    | 10,080,936  | 14,279,370  | 239.7      |
| Lawn care Retailing   | 202,706,057  | 17,719,575 | 32,606,159  | 57,038,582   | 79,972,512  | 118,637,678 | 1,343.6    |
| Other Wholesaling Activities <sup>a</sup>                       | 5,280,639    | 230,663    | 367,494     | 641,071      | 987,740     | 1,516,987   | 9.2        |

Table 8 Cont'd. Impacts by Sector for New Hampshire.

|                                 |               |             |             |             |             |               |          |
|---------------------------------|---------------|-------------|-------------|-------------|-------------|---------------|----------|
| Municipal – Grounds Maintenance | 1,597,310     | 69,772      | 111,161     | 193,914     | 298,776     | 458,865       | 2.8      |
| Airports                        | 185,295       | 8,094       | 12,895      | 22,495      | 34,659      | 53,230        | 0.3      |
| Roadways                        | 387,914       | 16,944      | 26,996      | 47,093      | 72,559      | 111,437       | 0.7      |
| Fields                          | 1,211,532     | 52,921      | 84,314      | 147,080     | 226,616     | 348,041       | 2.1      |
| School Grounds                  | 1,037,143     | 45,303      | 72,178      | 125,909     | 193,997     | 297,944       | 1.8      |
| Cemetery                        | 861,446       | 37,629      | 59,950      | 104,580     | 161,133     | 247,470       | 1.5      |
| Golf Course - Upkeep            | 39,996,767    | 1,747,090   | 2,783,484   | 4,855,617   | 7,481,373   | 11,490,011    | 70.6     |
| Total                           | 1,163,767,125 | 153,642,897 | 267,412,722 | 468,238,813 | 688,647,379 | 1,098,196,141 | 13,846.4 |

<sup>a</sup> The categories in other wholesaling activities do not include labor expenses or contracted expenses, even though these are considerable for all sectors listed. The values presented are only for inputs to turfgrass.

Table 9. Impacts by Sector for Rhode Island.

| Sector  | Direct Sales | Indirect   | Induced     | Labor Income | Value Added | Output      | Employment |
|---|--------------|------------|-------------|--------------|-------------|-------------|------------|
| Sod Production  | 12,625,310   | 1,774,771  | 2,364,345   | 4,143,358    | 10,867,175  | 16,764,426  | 221.6      |
| Lawn Equipment Manufacturing                                    | -            | -          | -           | -            | -           | -           | -          |
| Lawn care Wholesaling   | 135,295,600  | 5,814,927  | 8,413,128   | 14,709,559   | 24,796,474  | 37,769,489  | 224.3      |
| Lawn care Service – Total                                       | 320,515,860  | 68,825,955 | 124,509,121 | 218,412,255  | 302,179,550 | 513,850,936 | 6,430.0    |
| Lawn care Service – Residential                                 | 103,915,567  | 20,764,338 | 41,841,956  | 73,379,676   | 99,726,654  | 166,521,860 | 2,266.4    |
| Lawn care Service – Commercial                                  | 170,200,445  | 34,009,337 | 68,531,787  | 120,186,550  | 163,339,540 | 272,741,569 | 3,712.0    |
| Lawn care Service – Landscape Architectural and Design Services | 2,854,980    | 888,352    | 1,469,117   | 2,578,689    | 3,248,616   | 5,212,450   | 46.7       |
| Lawn care Service – Landscape Construction                      | 43,544,868   | 13,163,928 | 12,666,261  | 22,267,340   | 35,864,740  | 69,375,057  | 404.9      |
| Golf Course - Total   | 128,863,928  | 21,318,856 | 52,466,276  | 91,860,541   | 138,205,534 | 192,622,487 | 2,418.6    |
| Golf Course – Playing   | 112,040,821  | 19,923,748 | 49,717,786  | 87,037,183   | 130,379,820 | 181,682,354 | 2,238.0    |
| Golf Course – Apparel and Equipment                             | 16,823,106   | 1,395,108  | 2,748,490   | 4,823,358    | 7,825,714   | 10,940,133  | 180.6      |
| Lawn care Retailing   | 161,200,612  | 12,284,650 | 23,347,453  | 40,901,116   | 62,870,287  | 89,956,711  | 936.9      |
| Other Wholesaling Activities <sup>a</sup>                       | 13,168,064   | 565,955    | 818,832     | 1,431,653    | 2,413,393   | 3,676,030   | 21.9       |

Table 9 Cont'd. Impacts by Sector for Rhode Island.

|                                 |             |             |             |             |             |             |          |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|
| Municipal – Grounds Maintenance | 10,999,533  | 472,754     | 683,987     | 1,195,887   | 2,015,953   | 3,070,660   | 18.2     |
| Airports                        | 32,070      | 1,378       | 1,994       | 3,487       | 5,878       | 8,952       | 0.1      |
| Roadways                        | 156,483     | 6,725       | 9,730       | 17,013      | 28,679      | 43,683      | 0.3      |
| Fields                          | 698,622     | 30,026      | 43,442      | 75,955      | 128,041     | 195,029     | 1.2      |
| School Grounds                  | 727,318     | 31,260      | 45,227      | 79,075      | 133,300     | 203,040     | 1.2      |
| Cemetery                        | 554,037     | 23,812      | 34,452      | 60,236      | 101,542     | 154,666     | 0.9      |
| Golf Course - Upkeep            | 20,175,360  | 867,125     | 1,254,570   | 2,193,498   | 3,697,665   | 5,632,208   | 33.4     |
| Total                           | 771,669,373 | 110,585,114 | 211,919,155 | 371,458,482 | 541,332,413 | 854,640,079 | 10,253.3 |

<sup>a</sup> The categories in other wholesaling activities do not include labor expenses or contracted expenses, even though these are considerable for all sectors listed. The values presented are only for inputs to turfgrass.

Table 10. Impacts by Sector for Vermont.

| Sector  | Direct Sales | Indirect   | Induced    | Labor Income | Value Added | Output      | Employment |
|---|--------------|------------|------------|--------------|-------------|-------------|------------|
| Sod Production  | 116,044      | 15,755     | 174,766    | 328,035      | 193,075     | 305,019     | 3.1        |
| Lawn Equipment Manufacturing                                    | 13,041,846   | 2,538,010  | 1,504,790  | 2,504,738    | 4,286,083   | 17,084,645  | 63.9       |
| Lawn care Wholesaling   | 541,182,400  | 21,311,083 | 27,517,038 | 50,807,986   | 87,470,774  | 142,993,856 | 956.5      |
| Lawn care Service – Total                                       | 218,654,747  | 42,362,066 | 63,625,826 | 118,148,356  | 179,424,668 | 324,642,638 | 4,744.6    |
| Lawn care Service – Residential                                 | 70,890,819   | 12,699,996 | 21,538,129 | 39,988,279   | 58,729,923  | 105,128,944 | 1,688.3    |
| Lawn care Service – Commercial                                  | 116,110,121  | 20,800,973 | 35,276,709 | 65,495,701   | 96,192,124  | 172,187,803 | 2,765.3    |
| Lawn care Service – Landscape Architectural and Design Services | 1,947,657    | 570,736    | 843,930    | 1,565,100    | 1,937,275   | 3,362,323   | 34.2       |
| Lawn care Service – Landscape Construction                      | 29,706,150   | 8,290,361  | 5,967,058  | 11,099,276   | 22,565,346  | 43,963,568  | 256.8      |
| Golf Course - Total   | 53,377,516   | 8,910,022  | 14,996,938 | 27,760,745   | 48,472,919  | 71,308,288  | 1,086.1    |
| Golf Course – Playing   | 43,350,353   | 8,159,155  | 13,509,043 | 25,000,780   | 44,073,887  | 65,018,552  | 976.4      |
| Golf Course – Apparel and Equipment                             | 10,027,164   | 750,867    | 1,487,895  | 2,759,965    | 4,399,032   | 6,289,736   | 109.7      |
| Lawn care Retailing   | 96,081,238   | 6,549,529  | 12,545,750 | 23,251,428   | 35,163,195  | 51,474,657  | 566.8      |
| Other Wholesaling Activities <sup>a</sup>                       | 5,185,495    | 204,198    | 263,660    | 486,832      | 838,125     | 1,370,135   | 9.1        |

Table 10 Cont'd. Impacts by Sector for Vermont.

|                                 |             |            |             |             |             |             |         |
|---------------------------------|-------------|------------|-------------|-------------|-------------|-------------|---------|
| Municipal – Grounds Maintenance | 2,099,680   | 82,683     | 106,760     | 197,125     | 339,369     | 554,787     | 3.7     |
| Airports                        | 220,929     | 8,700      | 11,233      | 20,742      | 35,708      | 58,375      | 0.4     |
| Roadways                        | 344,817     | 13,578     | 17,532      | 32,373      | 55,732      | 91,109      | 0.6     |
| Fields                          | 638,923     | 25,160     | 32,487      | 59,984      | 103,268     | 168,819     | 1.1     |
| School Grounds                  | 758,081     | 29,852     | 38,545      | 71,171      | 122,528     | 200,304     | 1.3     |
| Cemetery                        | 1,123,064   | 44,225     | 57,103      | 105,437     | 181,520     | 296,741     | 2.0     |
| Golf Course - Upkeep            | 24,422,805  | 961,739    | 1,241,805   | 2,292,893   | 3,947,434   | 6,453,113   | 43.2    |
| Total                           | 927,639,286 | 81,890,663 | 120,628,768 | 223,288,120 | 355,848,839 | 609,179,238 | 7,430.1 |

<sup>a</sup> The categories in other wholesaling activities do not include labor expenses or contracted expenses, even though these are considerable for all sectors listed. The values presented are only for inputs to turfgrass.

## SECTOR BY SECTOR IMPACTS

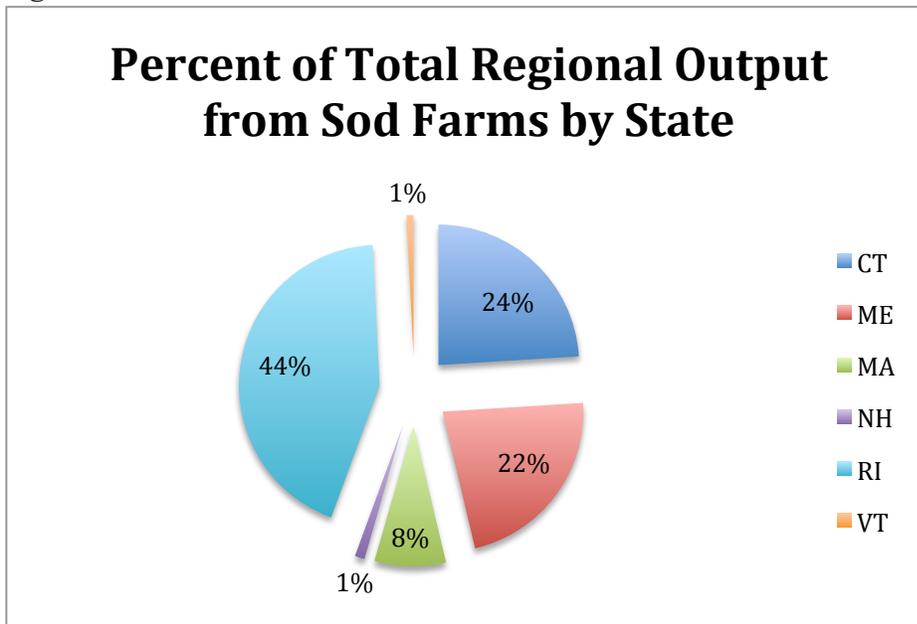
### SOD PRODUCERS

Sod producers are farms either partially or exclusively dedicated to growing sod. Based on 2012 Agricultural Census estimates New England has 121 sod farms covering 5,869 acres. Table 11 shows a breakdown of farms and acreage per state with Figure 1 indicating the state breakdown based on total regional output.

Table 11. Sod Farms and Acreage per State in New England.

| State | Number of Farms | Acres | Value of Sales (\$ millions) |
|-------|-----------------|-------|------------------------------|
| CT    | 8               | 1,357 | 6.1                          |
| ME    | 9               | 958   | 5.1                          |
| MA    | 6               | 607   | 2.1                          |
| NH    | 1               | 65    | 0.3                          |
| RI    | 15              | 2,857 | 12.6                         |
| VT    | 1               | 25    | 0.1                          |
| TOTAL | 40              | 5,869 | 26.4                         |

Figure 1.



The regional impact of sod producers is detailed below in Table 12, including the induced and indirect impacts for employment, labor income, value added, and total output. In total, this sector provides 460 jobs and \$14.5 million in labor income to the New England economy. The total output is around \$38.5 million.

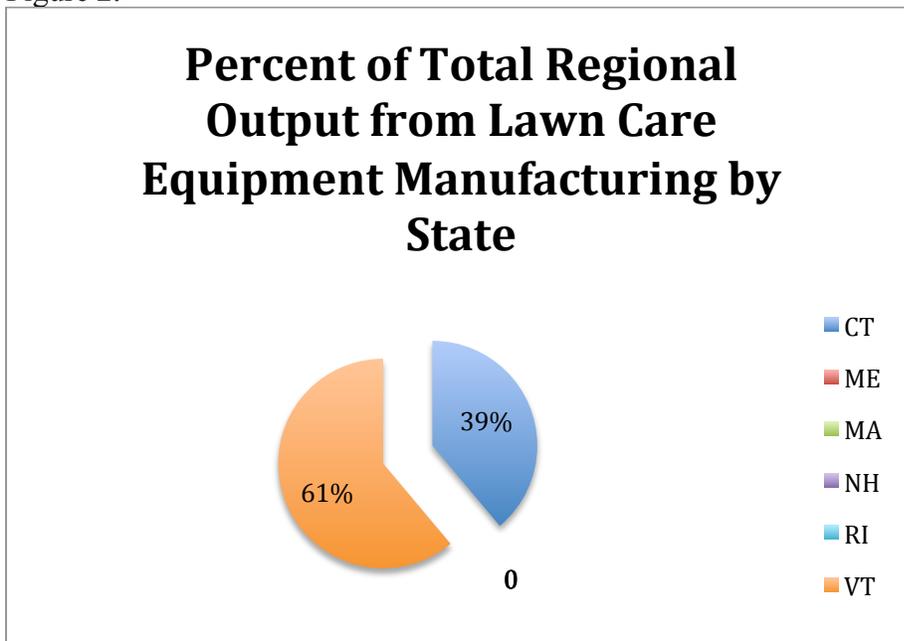
Table 12. Total Impact for New England by Sod Producers.

|          | Direct Sales<br>(in thousands) | Total<br>Employment | Total Labor<br>Income (in<br>thousands) | Total Value<br>Added (in<br>thousands) | Total Output<br>(in thousands) |
|----------|--------------------------------|---------------------|---|--|--------------------------------|
| Direct   | 26,297                         | 346                 | 9,867                                   | 17,301                                 | 26,296                         |
| Indirect |                                | 47                  | 1,622                                   | 2,254                                  | 3,969                          |
| Induced  |                                | 67                  | 3,039                                   | 5,331                                  | 8,181                          |
| Total    |                                | 460                 | 14,527                                  | 24,887                                 | 38,446                         |

LAWN EQUIPMENT MANUFACTURING

“The lawn equipment manufacturing 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” (Haydu et al. 2006). In 2012, only Vermont (1) and Connecticut (2) had lawn equipment manufacturing as measured by the U.S. Census Bureau 2012 Manufacturing and Industry Series. Interestingly, since 2004 every state except Rhode Island had lawn equipment manufacturing at some point. Figure 2 shows the percentage contribution of each of the six New England states to the regional output.

Figure 2.



The regional impact of the lawn care equipment manufacturing sector is detailed below in Table 13. In total, this sector provides 97 jobs and \$4.8 million in labor income to the New England economy. Value added and total output were \$9.1 million and \$28 million, respectively.

Table 13. Total Impact for New England by the Lawn Equipment Manufacturing Sector.

|          | Direct Sales<br>(in thousands) | Total<br>Employment | Total Labor<br>Income (in<br>thousands) | Total Value<br>Added (in<br>thousands) | Total Output<br>(in thousands) |
|----------|--------------------------------|---------------------|---|--|--------------------------------|
| Direct   | 20,867                         | 48                  | 2,207                                   | 4,875                                  | 20,867                         |
| Indirect |                                | 26                  | 1,576                                   | 2,520                                  | 4,377                          |
| Induced  |                                | 23                  | 1,014                                   | 1,762                                  | 2,712                          |
| Total    |                                | 97                  | 4,797                                   | 9,157                                  | 27,956                         |

LAWN CARE WHOLESALING

For this report lawn care wholesaling constitutes "... push and ride-on lawn mowers, leaf blowers, mulching machines and snow clearing equipment." (IBIS World Report, 2014). As shown in Figure 3 Massachusetts provides the largest total regional output followed by Vermont. The overall impact of lawn care wholesaling to the regional economy is \$719 million or \$49 per resident (Table 14).

Figure 3.

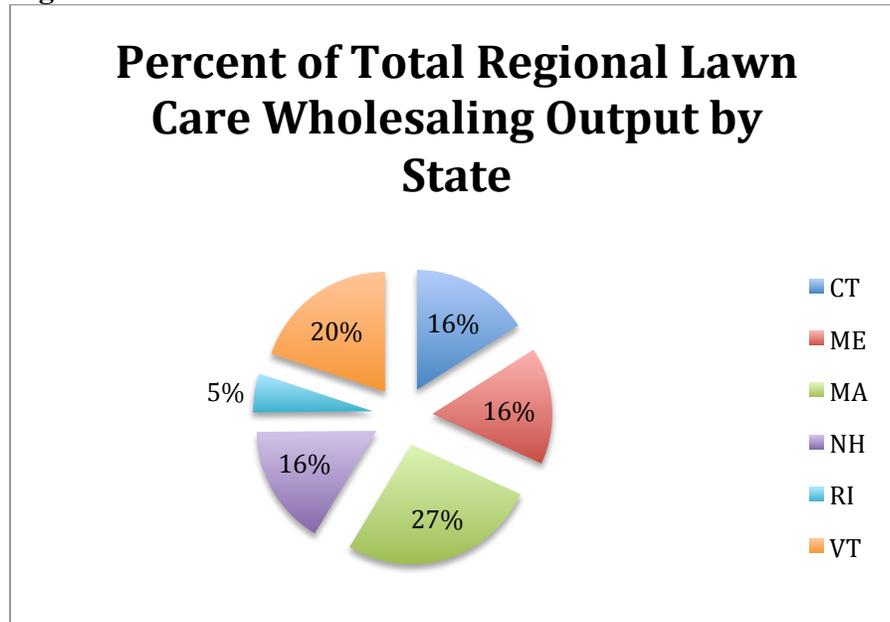


Table 14. Total Impact for New England by the Lawn Care Wholesaling Sector.

|          | Direct Sales<br>(in millions) | Total<br>Employment | Total Labor<br>Income (in<br>millions) | Total Value<br>Added (in<br>millions) | Total Output<br>(in millions) |
|----------|-------------------------------|---------------------|--|---------------------------------------|-------------------------------|
| Direct   | 2,571                         | 2,115               | 177                                    | 298                                   | 447                           |
| Indirect |                               | 865                 | 49                                     | 71                                    | 112                           |
| Induced  |                               | 1,306               | 60                                     | 104                                   | 159                           |
| Total    |                               | 4,286               | 285                                    | 473                                   | 719                           |

#### LAWN CARE SERVICES

The lawn care service sector includes residential and commercial lawn care, landscape and design services, and landscape construction. For this analysis we did not include snow plow/removal as part of the sector. Massachusetts has the greatest contribution accounting for 45% of the total regional output while Vermont has the smallest with only 5% of the output. The percentage contribution per state is shown in Figure 4.

Figure 4.

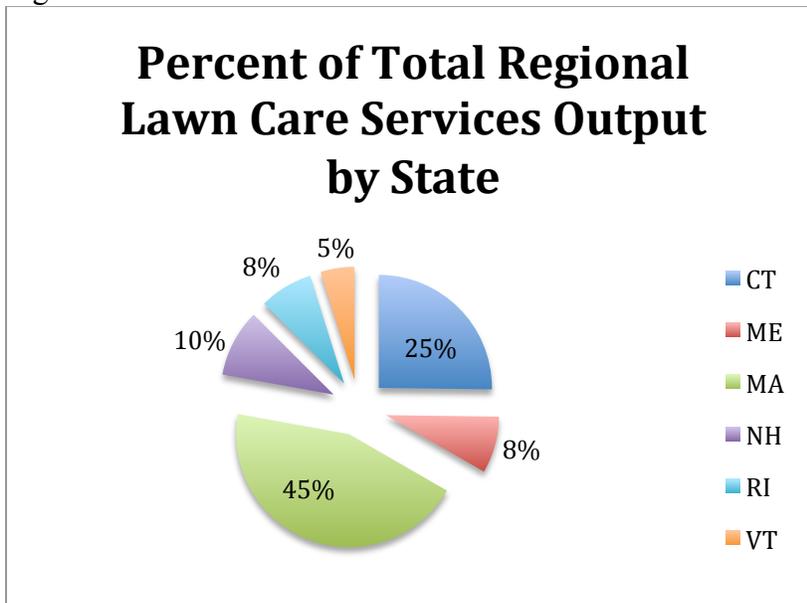


Table 15 shows a breakdown of lawn care service contributions per state and a comparison to 2002 values. The lawn care service sector has grown by 4,689 firms and \$3.3 billion in sales over the past 10 years.

Table 15. Lawn Care Service Firms and Sales per State, 2002 and 2012 Comparison.

| State | 2002 <sup>a</sup> |   | 2012            |                     |
|-------|-------------------|---|-----------------|---------------------|
|       | Number of Firms   | Sales (dollars in millions – real dollars) <sup>b</sup> | Number of Firms | Sales (in millions) |
| CT    | 897               | 320   | 1,936           | 1,032               |
| ME    | 227               | 62  | 639             | 341                 |
| MA    | 1,237             | 479   | 3,366           | 1,795               |
| NH    | 278               | 85  | 768             | 410                 |
| RI    | 251               | 58  | 601             | 321                 |
| VT    | 141               | 33  | 410             | 219                 |
| TOTAL | 3,031             | 1,037   | 7,720           | 4,109               |

<sup>a</sup> 2002 numbers come from Haydu, Hodges, and Hall 2006.

<sup>b</sup> Adjusted to 2012 real dollars.

The regional impact of the lawn care services sector is detailed below in Table 16. In total, the New England lawn care services sector provides 82,086 jobs and \$2.9 billion in labor income to the regional economy. Tables 16-19 give the direct, indirect, induced and total impacts for lawn care service sub-sectors of residential, commercial, landscape architectural and design services, and landscape construction, respectively.

Table 16. Total Impact for New England by the Lawn Care Services Sector.

|          | Direct Sales (dollars in millions) | Employment | Labor Income (dollars in millions) | Value Added (dollars in millions) | Output (dollars in millions) |
|----------|------------------------------------|------------|------------------------------------|-----------------------------------|------------------------------|
| Direct   | 4,117                              | 62,312     | 1,905                              | 2,331                             | 4,117                        |
| Indirect |                                    | 7,103      | 410                                | 622                               | 958                          |
| Induced  |                                    | 12,670     | 631                                | 1,071                             | 1,627                        |
| Total    |                                    | 82,086     | 2,947                              | 4,023                             | 6,703                        |

Table 17. Total Impact for New England by the Lawn Care Services Sector: Sub-sector Residential.

|          | Direct Sales (dollars in millions) | Employment | Labor Income (dollars in millions) | Value Added (dollars in millions) | Output (dollars in millions) |
|----------|------------------------------------|------------|------------------------------------|-----------------------------------|------------------------------|
| Direct   | 1,335                              | 22,496     | 638                                | 780                               | 1,335                        |
| Indirect |                                    | 2,080      | 122                                | 185                               | 282                          |
| Induced  |                                    | 4,162      | 207                                | 351                               | 534                          |
| Total    |                                    | 28,738     | 967                                | 1,317                             | 2,151                        |

Table 18. Total Impact for New England by the Lawn Care Services Sector: Sub-sector Commercial.

|          | Direct Sales<br>(dollars in<br>millions) | Employment | Labor Income<br>(dollars in<br>millions) | Value Added<br>(dollars in<br>millions) | Output<br>(dollars in<br>millions) |
|----------|--|------------|--|---|------------------------------------|
| Direct   | 2,186                                    | 36,845     | 1,045                                    | 1,278                                   | 2,186                              |
| Indirect |  | 3,407      | 199                                      | 303                                     | 462                                |
| Induced  |  | 6,817      | 339                                      | 575                                     | 875                                |
| Total    |  | 47,070     | 1,583                                    | 2,157                                   | 3,523                              |

Table 19. Total Impact for New England by the Lawn Care Services Sector: Sub-sector Landscape Architectural and Design Services.

|          | Direct Sales<br>(dollars in<br>millions) | Employment | Labor Income<br>(dollars in<br>millions) | Value Added<br>(dollars in<br>millions) | Output<br>(dollars in<br>millions) |
|----------|--|------------|--|---|------------------------------------|
| Direct   | 37                                       | 318        | 23                                       | 23                                      | 37                                 |
| Indirect |  | 96         | 6  | 8                                       | 12                                 |
| Induced  |  | 156        | 8  | 13                                      | 20                                 |
| Total    |  | 570        | 36                                       | 44                                      | 69                                 |

Table 20. Total Impact for New England by the Lawn Care Services Sector: Sub-sector Landscape Construction.

|          | Direct Sales<br>(dollars in<br>millions) | Employment | Labor Income<br>(dollars in<br>millions) | Value Added<br>(dollars in<br>millions) | Output<br>(dollars in<br>millions) |
|----------|--|------------|--|---|------------------------------------|
| Direct   | 559                                      | 2,653      | 200                                      | 250                                     | 559                                |
| Indirect |  | 1,520      | 85                                       | 125                                     | 202                                |
| Induced  |  | 1,535      | 78                                       | 131                                     | 199                                |
| Total    |  | 5,708      | 362                                      | 506                                     | 960                                |

#### LAWN CARE RETAILING

The lawn care retailing sector provides the turfgrass-related goods used for landscaping, lawn care, and pest management (insect, weed, and disease). This sector is mainly comprised of home improvement centers, such as Home Depot, Lowes, and Ace Hardware (Haydu et al. 2006) but is also made up of independent garden centers. This sector provides turfgrass and turfgrass maintenance products in their lawn and garden centers (Haydu et al. 2006). Table 21 gives estimated store types by state in 2014.

The New England lawn care retailing sector provides \$2.24 billion in direct sales to the regional economy. Massachusetts contributes the most with 45% of the direct sales and Vermont the least, only contributing 5% of the total. The percentage contribution of each state is given in Figure 5.

Table 21. Distribution of Store-Types per State.

| State | Number of Stores                     |  |
|-------|--------------------------------------|--|
|       | Home Improvement Stores <sup>a</sup> | Lawn and Outdoor Equipment Stores <sup>b</sup> |
| CT    | 53                                   | 76   |

|    |    |    |
|----|----|----|
| ME | 27 | 34 |
| MA | 96 | 76 |
| NH | 48 | 38 |
| RI | 16 | 11 |
| VT | 32 | 19 |

<sup>a</sup> Reference: IBIS World Reports

(<http://clients1.ibisworld.com/reports/us/industry/productsandmarkets.aspx?entid=1031>)

<sup>b</sup> Reference: IBIS World Reports

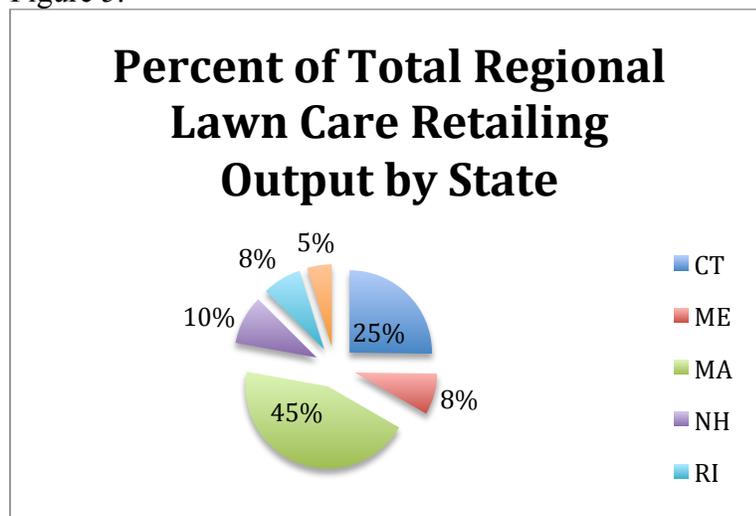
(<http://clients1.ibisworld.com/reports/us/industry/default.aspx?entid=1036>)

The regional impact of the lawn care retailing sector is detailed below in Table 22. In total, the New England lawn care retailing sector provides 12,914 jobs and almost \$600 million in labor income to the regional economy. As can be seen in Figure 5, MA and CT are the largest states for lawn care retailing.

Table 22. Total Impact for New England by the Lawn Care Retailing Sector.

|          | Direct Sales<br>(dollars in<br>millions) | Employment | Labor Income<br>(dollars in<br>millions) | Value Added<br>(dollars in<br>millions) | Output<br>(dollars in<br>millions) |
|----------|--|------------|--|---|------------------------------------|
| Direct   | 2,235                                    | 8,932      | 390                                      | 528                                     | 753                                |
| Indirect |  | 1,399      | 80                                       | 139                                     | 207                                |
| Induced  |  | 2,583      | 128                                      | 218                                     | 331                                |
| Total    |  | 12,914     | 598                                      | 885                                     | 1,291                              |

Figure 5.



#### GOLF COURSES

New England's 934 golf courses directly contribute \$2.5 billion to the regional economy (Tables 23 - 26) with MA having both the largest number of courses but also the most economic impact of any New England state (Figure 6). When breaking the numbers down further, we see playing golf (i.e. green fees and memberships) contributes the bulk of the impact.

Table 23. Number of Golf Courses per State in 2012.

| State | Courses | Population/Course |
|-------|---------|-------------------|
| CT    | 178     | 20,170            |
| ME    | 140     | 9,494             |
| MA    | 377     | 17,629            |
| NH    | 113     | 11,688            |
| RI    | 57      | 18,426            |
| VT    | 69      | 9,073             |
| Total | 934     | 15,592            |

<sup>a</sup> Reference: American Association of Retired People (<http://www.aarp.org/entertainment/arts-leisure/info-08-2011/golf-courses.html>)

Figure 6.

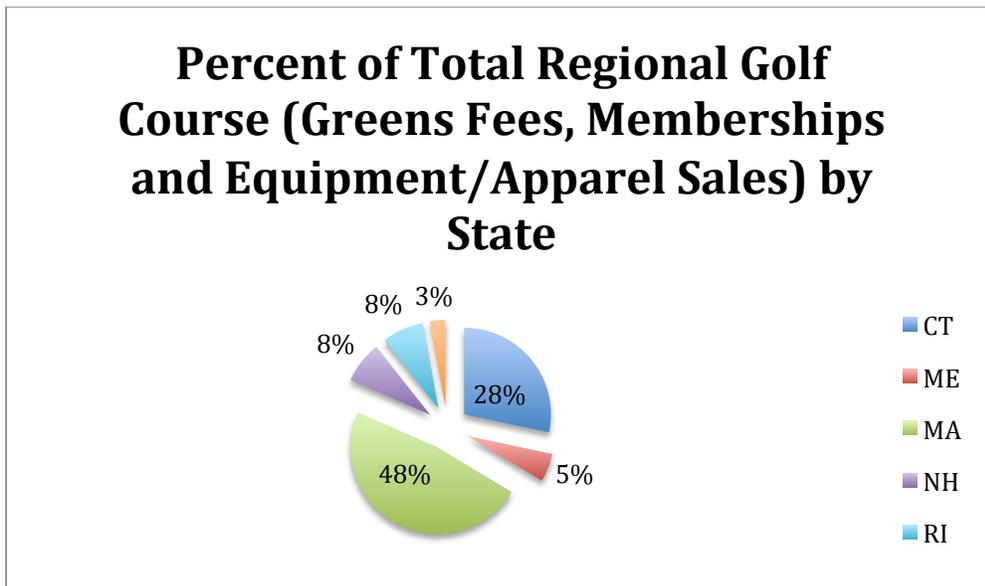


Table 24. Total Impact of New England Golf Courses.

|          | Direct Sales<br>(dollars in<br>millions) | Employment | Labor Income<br>(dollars in<br>millions) | Value Added<br>(dollars in<br>millions) | Output (dollars<br>in millions) |
|----------|--|------------|--|---|---------------------------------|
| Direct   | 1,601                                    | 26,635     | 742                                      | 986                                     | 1,461                           |
| Indirect |  | 2,929      | 161                                      | 268                                     | 404                             |
| Induced  |  | 4,894      | 248                                      | 419                                     | 635                             |
| Total    |  | 34,459     | 1,150                                    | 1,668                                   | 2,501                           |

Table 25. Total Impact of New England Golf Courses: Sub-sector Playing (i.e. green fees and memberships).

|          | Direct Sales<br>(dollars in<br>millions) | Employment | Labor Income<br>(dollars in<br>millions) | Value Added<br>(dollars in<br>millions) | Output (dollars<br>in millions) |
|----------|--|------------|--|---|---------------------------------|
| Direct   | 1,367                                    | 24,597     | 696                                      | 922                                     | 1,367                           |
| Indirect |  | 2,712      | 148                                      | 246                                     | 372                             |
| Induced  |  | 4,576      | 232                                      | 392                                     | 594                             |
| Total    |  | 31,884     | 1,076                                    | 1,560                                   | 2,333                           |

Table 26. Total Impact of New England Golf Courses: Sub-sector Equipment and Apparel Sales.

|          | Direct Sales<br>(dollars in<br>millions) | Employment | Labor Income<br>(dollars in<br>millions) | Value Added<br>(dollars in<br>millions) | Output (dollars<br>in millions) |
|----------|--|------------|--|---|---------------------------------|
| Direct   | 233                                      | 2,039      | 45                                       | 59                                      | 94                              |
| Indirect |  | 218        | 13                                       | 22                                      | 33                              |
| Induced  |  | 318        | 16                                       | 27                                      | 41                              |
| Total    |  | 2,575      | 74                                       | 108                                     | 168                             |

### **OTHER WHOLESALING CONSUMERS**

This study went beyond many previous studies to include a more complete analysis of wholesaling consumers. These firms sell directly to airports, school grounds, athletic fields, roadways, municipalities, cemeteries, and golf courses. Table 27 lists the total regional output by wholesaler. These values do not include labor or contracted services which are major components in maintaining turf at airports, roadways, athletic fields, etc. The numbers are only estimates associated with input sales by firms to manage turf at the locations indicated. Cemetery users contribute the most with \$5.3 million in regional output with airports contributing the least with only \$363,940 in total regional output.

Table 27. Breakdown of Acres Associated with Various Turf Operations.

| LOCATION                      | NUMBER IN NEW ENGLAND | APPROX. ACREAGE      |
|-------------------------------|-----------------------|----------------------|
| Airports (number)             | 365                   | 14,600               |
| Roadways (miles)              | 117,473               | 284,783 <sup>a</sup> |
| Athletic Fields (number)      | 14,846                | 14,219               |
| School Grounds (number)       | 7,132                 | 50,707               |
| Municipalities/Towns (number) | 1,662                 | NA                   |
| Cemetery (number)             | 6,130                 | 120,499              |
| Golf Courses (number)         | 934                   | 93,867               |
| Household lawns (number)      | 5,625,126             | 3,937,588            |

<sup>a</sup> Assumed 10 feet on each side of roadway as maintained. This is an overestimate as an unknown amount of area is not turf related.

In the various turf locations listed in Table 27, the impact of household lawns is captured in the lawn care retailing sector discussed above, so it will not be discussed here. Further, the results for turf-related expenditures at golf courses are presented in order to detail the impact associated with direct turf input purchasing. Golf turf expenditures in the context of this report can be thought of as sales by wholesalers/retailers to golf courses. The estimates for golf related turf expenditures are not incorporated into the sum of other wholesaler impacts because they are accounted for in the golf sector.

Golf turf inputs expenditures, not including labor, was estimated to be \$331 million with a regional total output of \$93 million. Total direct employment, golf course level, was 262 with indirect and induced employment at 107 and 168, respectively.

Table 28. Impact of Golf Turf Input Purchasing, not Including Labor.<sup>ab</sup>

|          | Direct Sales (in million dollars) | Total Employment | Total Labor Income (in million dollars) | Total Value Added (in million dollars) | Total Output (in million dollars) |
|----------|-----------------------------------|------------------|---|--|-----------------------------------|
| Direct   | 331                               | 262              | 23                                      | 39                                     | 58                                |
| Indirect |                                   | 107              | 7                                       | 10                                     | 15                                |
| Induced  |                                   | 168              | 8                                       | 14                                     | 21                                |
| Total    |                                   | 536              | 38                                      | 63                                     | 93                                |

<sup>a</sup> These values do not include labor or contracted services.

<sup>b</sup> Sales at these operations can also be thought of as expenditures on turf related items or sales to suppliers selling the inputs.

The regional impact of the other wholesalers (not including golf course input expenditures) is detailed in Table 29. In total, this sector provides 165 jobs and \$12 million in labor income to the New England economy. Detailed impacts for each sub-sector within other wholesaling are in Tables 29-35.

Table 29. Total Impact for New England by the Other Wholesaling Consumers' Sector.<sup>ab</sup>

|          | Direct Sales<br>(in million<br>dollars) | Total<br>Employment | Total Labor<br>Income (in<br>million<br>dollars) | Total Value<br>Added (in<br>million<br>dollars) | Total Output<br>(in million<br>dollars) |
|----------|---|---------------------|--|---|---|
| Direct   | 102                                     | 81                  | 7  | 12  | 18                                      |
| Indirect |   | 33                  | 2  | 3   | 5                                       |
| Induced  |   | 51                  | 3  | 4   | 7                                       |
| Total    |   | 165                 | 12   | 19  | 29                                      |

<sup>a</sup> These values do not include labor or contracted services.

<sup>b</sup> Sales at these operations can also be thought of as expenditures on turf related items or sales to suppliers selling the inputs.

Table 30. Total Impact for New England from Municipal Grounds Maintenance.<sup>ab</sup>

|          | Direct Sales<br>(in million<br>dollars) | Total<br>Employment | Total Labor<br>Income (in<br>million<br>dollars) | Total Value<br>Added (in<br>million<br>dollars) | Total Output<br>(in million<br>dollars) |
|----------|---|---------------------|--|---|---|
| Direct   | 56                                      | 45                  | 4  | 7   | 10                                      |
| Indirect |   | 19                  | 1  | 2   | 3                                       |
| Induced  |   | 28                  | 1  | 2   | 4                                       |
| Total    |   | 92                  | 6  | 11  | 16                                      |

<sup>a</sup> These values do not include labor or contracted services.

<sup>b</sup> Sales at these operations can also be thought of as expenditures on turf related items or sales to suppliers selling the inputs.

Table 31. Total Impact for New England from Airport Grounds Maintenance.<sup>ab</sup>

|          | Direct Sales<br>(in thousand<br>dollars) | Total<br>Employment | Total Labor<br>Income (in<br>thousand<br>dollars) | Total Value<br>Added (in<br>thousand<br>dollars) | Total Output<br>(in thousand<br>dollars) |
|----------|--|---------------------|---|--|--|
| Direct   | 1.3                                      | 1.1                 | 88  | 149  | 226                                      |
| Indirect |  | 0.6                 | 25  | 36   | 57                                       |
| Induced  |  | 0.6                 | 30  | 52   | 80                                       |
| Total    |  | 2.3                 | 142   | 237  | 364                                      |

<sup>a</sup> These values do not include labor or contracted services.

<sup>b</sup> Sales at these operations can also be thought of as expenditures on turf related items or sales to suppliers selling the inputs.

Table 32. Total Impact for New England from Roadway Maintenance.<sup>ab</sup>

|          | Direct Sales<br>(in thousand<br>dollars) | Total<br>Employment | Total Labor<br>Income (in<br>thousand<br>dollars) | Total Value<br>Added (in<br>thousand<br>dollars) | Total Output<br>(in thousand<br>dollars) |
|----------|--|---------------------|---|--|--|
| Direct   | 2.8                                      | 2                   | 197   | 332  | 493                                      |
| Indirect |  | 1                   | 55  | 80   | 125                                      |
| Induced  |  | 1                   | 68  | 117  | 179                                      |
| Total    |  | 5                   | 319   | 529  | 797                                      |

<sup>a</sup> These values do not include labor or contracted services.

<sup>b</sup> Sales at these operations can also be thought of as expenditures on turf related items or sales to suppliers selling the inputs.

Table 33. Total Impact for New England from Athletic Fields Maintenance.<sup>ab</sup>

|          | Direct Sales<br>(in thousand<br>dollars) | Total<br>Employment | Total Labor<br>Income (in<br>thousand<br>dollars) | Total Value<br>Added (in<br>thousand<br>dollars) | Total Output<br>(in thousand<br>dollars) |
|----------|--|---------------------|---|--|--|
| Direct   | 12,521                                   | 10                  | 887   | 1,495  | 2,179                                    |
| Indirect |  | 4                   | 248   | 364  | 557                                      |
| Induced  |  | 6                   | 310   | 528  | 804                                      |
| Total    |  | 20                  | 1,445   | 2,386  | 3,539                                    |

<sup>a</sup> These values do not include labor or contracted services.

<sup>b</sup> Sales at these operations can also be thought of as expenditures on turf related items or sales to suppliers selling the inputs.

Table 34. Total Impact for New England from School Grounds.<sup>ab</sup>

|          | Direct Sales<br>(in thousand<br>dollars) | Total<br>Employment | Total Labor<br>Income (in<br>thousand<br>dollars) | Total Value<br>Added (in<br>thousand<br>dollars) | Total Output<br>(in thousand<br>dollars) |
|----------|--|---------------------|---|--|--|
| Direct   | 10,270                                   | 8                   | 724   | 1,220  | 1,787                                    |
| Indirect |  | 3                   | 202   | 296  | 455                                      |
| Induced  |  | 5                   | 251   | 430  | 655                                      |
| Total    |  | 17                  | 1,177   | 1,946  | 2,897                                    |

<sup>a</sup> These values do not include labor or contracted services.

<sup>b</sup> Sales at these operations can also be thought of as expenditures on turf related items or sales to suppliers selling the inputs.

Table 35. Total Impact for New England from Cemetery Maintenance <sup>ab</sup>

|          | Direct Sales<br>(in thousand<br>dollars) | Total<br>Employment | Total Labor<br>Income (in<br>thousand<br>dollars) | Total Value<br>Added (in<br>thousand<br>dollars) | Total Output<br>(in thousand<br>dollars) |
|----------|--|---------------------|---|--|--|
| Direct   | 18,908                                   | 15                  | 1,344   | 2,275  | 3,290                                    |
| Indirect |  | 6                   | 374   | 552  | 839                                      |
| Induced  |  | 9                   | 472   | 798  | 1,216                                    |
| Total    |  | 30                  | 2,190   | 3,625  | 5,345                                    |

<sup>a</sup> These values do not include labor or contracted services.

<sup>b</sup> Sales at these operations can also be thought of as expenditures on turf related items or sales to suppliers selling the inputs.

### CONCLUSIONS

Based on the results presented in this report it is clear that the turfgrass industry has a substantial impact on the regional New England economy. The turfgrass industry contributes over \$10.6 billion in direct sales, \$5 billion in labor income, \$7.1 billion in value added, with a total output impact of \$11.3 billion in 2012. Furthermore 134,000 people are either directly or indirectly impacted by the turfgrass industry. These contributions to the economy do not take into account aesthetic or sectors (such as golf) that have impacts farther away from turf than this report examined. With respect to state differences, MA had the largest impact while VT had the smallest impact on the regional economy. However, each state makes important contributions through the various turfgrass sectors and as an entire industry.

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**APPENDIX A –ECONOMIC MULTIPLIERS**

**Table A-1.** Multipliers for sod farms (nursery and greenhouse sector).

| STATE         | Output<br>(dollars per dollar output) |          |         | Employment<br>(jobs per million dollars output) |          |         | Value Added<br>(dollars per dollar output) |          |         |
|---------------|---------------------------------------|----------|---------|---|----------|---------|--|----------|---------|
|               | Direct                                | Indirect | Induced | Direct  | Indirect | Induced | Direct                                     | Indirect | Induced |
| Connecticut   | 1.000                                 | 0.163    | 0.336   | 11.263  | 2.080    | 2.438   | 0.660                                      | 0.098    | 0.235   |
| Maine         | 1.000                                 | 0.145    | 0.536   | 10.688  | 2.037    | 4.854   | 0.660                                      | 0.079    | 0.339   |
| Massachusetts | 1.000                                 | 0.165    | 0.368   | 15.173  | 1.888    | 2.760   | 0.660                                      | 0.104    | 0.244   |
| New Hampshire | 1.000                                 | 0.130    | 0.295   | 20.954  | 2.675    | 2.458   | 0.660                                      | 0.074    | 0.194   |
| Rhode Island  | 1.000                                 | 0.140    | 0.187   | 14.424  | 1.616    | 1.503   | 0.660                                      | 0.078    | 0.123   |
| Vermont       | 1.000                                 | 0.137    | 1.526   | 10.373  | 2.494    | 14.215  | 0.660                                      | 0.071    | 0.955   |

Source: *Implan*

**Table A-2.** Multipliers for lawn care services (services to buildings and dwellings).

| STATE         | Output<br>(dollars per dollar output) |          |         | Employment<br>(jobs per million dollars output) |          |         | Value Added<br>(dollars per dollar output) |          |         |
|---------------|---------------------------------------|----------|---------|---|----------|---------|--|----------|---------|
|               | Direct                                | Indirect | Induced | Direct  | Indirect | Induced | Direct                                     | Indirect | Induced |
| Connecticut   | 1.000                                 | 0.214    | 0.369   | 16.437  | 1.401    | 2.680   | 0.601                                      | 0.153    | 0.258   |
| Maine         | 1.000                                 | 0.200    | 0.383   | 18.789  | 1.784    | 3.460   | 0.544                                      | 0.117    | 0.243   |
| Massachusetts | 1.000                                 | 0.204    | 0.428   | 15.781  | 1.419    | 3.211   | 0.617                                      | 0.139    | 0.285   |
| New Hampshire | 1.000                                 | 0.196    | 0.390   | 17.401  | 1.583    | 3.250   | 0.578                                      | 0.128    | 0.256   |
| Rhode Island  | 1.000                                 | 0.199    | 0.402   | 16.981  | 1.585    | 3.237   | 0.588                                      | 0.107    | 0.264   |
| Vermont       | 1.000                                 | 0.179    | 0.304   | 19.324  | 1.676    | 2.815   | 0.531                                      | 0.107    | 0.190   |

Source: *Implan*

Table A-3. Multipliers for lawn care wholesaling (Wholesale trade businesses).

| STATE         | Output<br>(dollars per dollar output) |          |         | Employment<br>(jobs per million dollars output) |          |         | Value Added<br>(dollars per dollar output) |          |         |
|---------------|---------------------------------------|----------|---------|---|----------|---------|--|----------|---------|
|               | Direct                                | Indirect | Induced | Direct  | Indirect | Induced | Direct                                     | Indirect | Induced |
| Connecticut   | 1.000                                 | 0.262    | 0.364   | 4.190   | 1.707    | 2.739   | 0.713                                      | 0.177    | 0.244   |
| Maine         | 1.000                                 | 0.266    | 0.343   | 5.171   | 2.401    | 3.096   | 0.628                                      | 0.158    | 0.217   |
| Massachusetts | 1.000                                 | 0.252    | 0.382   | 4.234   | 1.613    | 2.842   | 0.710                                      | 0.171    | 0.252   |
| New Hampshire | 1.000                                 | 0.251    | 0.399   | 4.817   | 1.994    | 3.327   | 0.653                                      | 0.159    | 0.262   |
| Rhode Island  | 1.000                                 | 0.246    | 0.357   | 4.718   | 1.930    | 2.872   | 0.660                                      | 0.158    | 0.234   |
| Vermont       | 1.000                                 | 0.226    | 0.292   | 5.352   | 2.100    | 2.704   | 0.615                                      | 0.131    | 0.183   |

Source: *Implan*

Table A-4. Multipliers for lawn care equipment manufacturing (land & garden equipment manufacturing)

| STATE                | Output<br>(dollars per dollar output) |          |         | Employment<br>(jobs per million dollars output) |          |         | Value Added<br>(dollars per dollar output) |          |         |
|----------------------|---------------------------------------|----------|---------|---|----------|---------|--|----------|---------|
|                      | Direct                                | Indirect | Induced | Direct  | Indirect | Induced | Direct                                     | Indirect | Induced |
| Connecticut          | 1.000                                 | 0.286    | 0.182   | 2.340   | 1.294    | 1.322   | 0.203                                      | 0.167    | 0.127   |
| Maine                | 1.000                                 | 0.194    | 0.115   | 2.500   | 1.350    | 1.038   | 0.149                                      | 0.107    | 0.073   |
| Massachusetts        | 1.000                                 | 0.291    | 0.162   | 2.404   | 1.400    | 1.215   | 0.181                                      | 0.169    | 0.108   |
| New Hampshire        | 1.000                                 | 0.000    | 0.000   | 0.000   | 0.000    | 0.000   | 0.000                                      | 0.000    | 0.000   |
| Rhode Island         | 1.000                                 | 0.000    | 0.000   | 0.000   | 0.000    | 0.000   | 0.000                                      | 0.000    | 0.000   |
| Vermont <sup>a</sup> | 1.000                                 | 0.000    | 0.000   | 0.000   | 0.000    | 0.000   | 0.000                                      | 0.000    | 0.000   |

<sup>a</sup> Multipliers for Vermont were not provided by *Implan* so the Maine multipliers were applied.

Source: *Implan*

**Table A-5.** Multipliers for lawn care retailing (building material and garden supply stores).

| STATE         | Output<br>(dollars per dollar output) |          |         | Employment<br>(jobs per million dollars output) |          |         | Value Added<br>(dollars per dollar output) |          |         |
|---------------|---------------------------------------|----------|---------|---|----------|---------|--|----------|---------|
|               | Direct                                | Indirect | Induced | Direct  | Indirect | Induced | Direct                                     | Indirect | Induced |
| Connecticut   | 1.000                                 | 0.253    | 0.414   | 11.591  | 1.561    | 3.000   | 0.736                                      | 0.181    | 0.289   |
| Maine         | 1.000                                 | 0.233    | 0.431   | 12.601  | 1.992    | 3.893   | 0.713                                      | 0.143    | 0.273   |
| Massachusetts | 1.000                                 | 0.270    | 0.486   | 12.361  | 1.737    | 3.642   | 0.718                                      | 0.187    | 0.323   |
| New Hampshire | 1.000                                 | 0.259    | 0.477   | 13.767  | 1.924    | 3.971   | 0.686                                      | 0.171    | 0.313   |
| Rhode Island  | 1.000                                 | 0.226    | 0.429   | 12.155  | 1.630    | 3.454   | 0.723                                      | 0.152    | 0.282   |
| Vermont       | 1.000                                 | 0.202    | 0.387   | 12.186  | 1.733    | 3.587   | 0.722                                      | 0.121    | 0.243   |

Source: *Implan***Table A-6.** Multipliers for golf courses (amusement, gambling and recreation services).

| STATE         | Output<br>(dollars per dollar output) |          |         | Employment<br>(jobs per million dollars output) |          |         | Value Added<br>(dollars per dollar output) |          |         |
|---------------|---------------------------------------|----------|---------|---|----------|---------|--|----------|---------|
|               | Direct                                | Indirect | Induced | Direct  | Indirect | Induced | Direct                                     | Indirect | Induced |
| Connecticut   | 1.000                                 | 0.217    | 0.387   | 15.875  | 1.454    | 2.808   | 0.744                                      | 0.153    | 0.271   |
| Maine         | 1.000                                 | 0.229    | 0.426   | 19.512  | 2.075    | 3.846   | 0.685                                      | 0.138    | 0.270   |
| Massachusetts | 1.000                                 | 0.269    | 0.466   | 19.123  | 1.887    | 3.491   | 0.692                                      | 0.180    | 0.310   |
| New Hampshire | 1.000                                 | 0.260    | 0.426   | 21.710  | 2.091    | 3.546   | 0.650                                      | 0.168    | 0.280   |
| Rhode Island  | 1.000                                 | 0.177    | 0.443   | 14.977  | 1.425    | 3.565   | 0.758                                      | 0.114    | 0.291   |
| Vermont       | 1.000                                 | 0.188    | 0.312   | 17.907  | 1.732    | 2.882   | 0.711                                      | 0.110    | 0.195   |

Source: *Implan*

**Table A-7.** Multipliers for cemeteries (deathcare services sector).

| STATE         | Output<br>(dollars per dollar output) |          |         | Employment<br>(jobs per million dollars output) |          |         | Value Added<br>(dollars per dollar output) |          |         |
|---------------|---------------------------------------|----------|---------|---|----------|---------|--|----------|---------|
|               | Direct                                | Indirect | Induced | Direct  | Indirect | Induced | Direct                                     | Indirect | Induced |
| Connecticut   | 1.000                                 | 0.193    | 0.498   | 8.141   | 1.190    | 3.620   | 0.741                                      | 0.132    | 0.348   |
| Maine         | 1.000                                 | 0.239    | 0.513   | 11.856  | 2.008    | 4.643   | 0.623                                      | 0.135    | 0.325   |
| Massachusetts | 1.000                                 | 0.232    | 0.570   | 9.565   | 1.520    | 4.289   | 0.696                                      | 0.147    | 0.379   |
| New Hampshire | 1.000                                 | 0.216    | 0.542   | 9.664   | 1.610    | 4.527   | 0.693                                      | 0.131    | 0.356   |
| Rhode Island  | 1.000                                 | 0.197    | 0.515   | 10.419  | 1.521    | 4.153   | 0.669                                      | 0.124    | 0.338   |
| Vermont       | 1.000                                 | 0.196    | 0.446   | 11.667  | 1.686    | 4.139   | 0.629                                      | 0.111    | 0.279   |

Source: *Implan*