

# RUTGERS

New Jersey Agricultural  
Experiment Station

## THE NEW JERSEY TURFGRASS INDUSTRY ECONOMIC SURVEY

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### Executive Summary

The Center for Turfgrass Science

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### Abstract

Cultivated turfgrass is a widespread feature of the suburban and urban landscape throughout New Jersey and the United States, yet few people understand the nature and importance of the turfgrass industry. The benefits of turfgrass are abundant, including erosion prevention, groundwater recharge, cleaner air, cooler ambient temperatures, glare reduction, and a healthy playing surface for recreational activities.

The turfgrass industry also makes a significant contribution to the state economy. This study revealed that the turf industry contributed \$3.2 billion to the New Jersey economy and provided 53,588 jobs in 2001. Moreover, turfgrass is a major land cover in New Jersey, accounting for 880,542 acres and making up 18% of the State's total land area. Six turf industry sectors are highlighted in this report to demonstrate the magnitude of the New Jersey turfgrass industry. Those sectors include service providers, sod producers, golf courses, cemeteries, homeowners, and other turfgrass consumers. Of these areas, the homeowner sector accounted for 76% of the total turfgrass acreage in New Jersey.

## Table of Contents

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Table of Contents .....	ii
List of Tables and Figures .....	ii
Overview .....	1
Service Providers .....	3
Sod Producers .....	6
Golf Courses .....	8
Cemeteries.....	13
Home Lawns .....	14
Other Turfgrass Consumers .....	17
<i>Parks</i> .....	19
<i>Schools</i> .....	20
<i>Houses of Worship</i> .....	20
<i>Institutions</i> .....	20
<i>Airports</i> .....	21
<i>Highways/Roadsides</i> .....	21
<i>Commercial Establishments</i> .....	21
Summary .....	21

## List of Tables and Figures

---

Table 1. Impacts of Turfgrass Sectors on the New Jersey Economy (\$ millions).....	2
Figure 1. Distribution of Economic Impacts from Turfgrass Expenditures on the New Jersey Economy .....	2
Table 2. Turfgrass Area by Sector .....	3
Figure 2. Distribution of New Jersey Service Provider Turfgrass Expenditures.....	3
Figure 3. Percentage Distribution of New Jersey Service Provider Clientele .....	4
Figure 4. Percentage Distribution of New Jersey Service Provider Sales .....	5
Figure 5. Distribution of Sod Sales by New Jersey Sod Producers .....	7
Figure 6. Distribution of New Jersey Sod Producer Expenditures .....	7
Figure 7. Distribution of Turfgrass Species on New Jersey Golf Courses .....	9
Figure 8. Distribution of Golf Courses in New Jersey by Type .....	10
Figure 9. Distribution of Revenues by New Jersey Golf Courses .....	11
Figure 10. Distribution of New Jersey Golf Course Expenditures .....	12
Figure 11. Distribution of Turfgrass Species among New Jersey Cemeteries .....	13
Figure 12. Distribution of New Jersey Cemetery Turfgrass Expenditures .....	14
Figure 13. Distribution of Turf-Related Expenses for NJ Single Family Homes.....	15
Figure 14. Distribution of Turfgrass Species among New Jersey Home Lawns .....	16
Table 3. Turf Statistics for Other New Jersey Turfgrass Consumers in 2001 .....	18
Figure 15. Distribution of Turfgrass Area by Sector for Other Consumers .....	18
Figure 16. Distribution of Turfgrass Expenditures by Sector for Other Consumers .....	19

## Overview

Cultivated turfgrass is a widespread feature of the suburban and urban landscapes throughout New Jersey and the United States. Turfgrass is grown for functional, aesthetic and recreational purposes. The benefits of turfgrass are abundant and include erosion prevention, groundwater recharge, cleaner air, cooler ambient temperatures, glare reduction, and a healthy playing surface for recreational activities. In New Jersey, a very large industry has evolved to produce and deliver turfgrass products and services. This industry contributes to New Jersey's economy in terms of employment, expenditures, sales and the additional value created by its economic activities.

The purpose of this study was to (1) evaluate the magnitude of the New Jersey turfgrass industry, in terms of number of acres maintained, number of workers, turf related expenses and its' total contribution to the state economy, and (2) to characterize the nature of New Jersey's turfgrass industry (i.e., species of turfgrass used, product sales, market distribution channels, and maintenance practices). To accomplish this objective, survey information from each sector of the New Jersey turfgrass industry were obtained and analyzed.

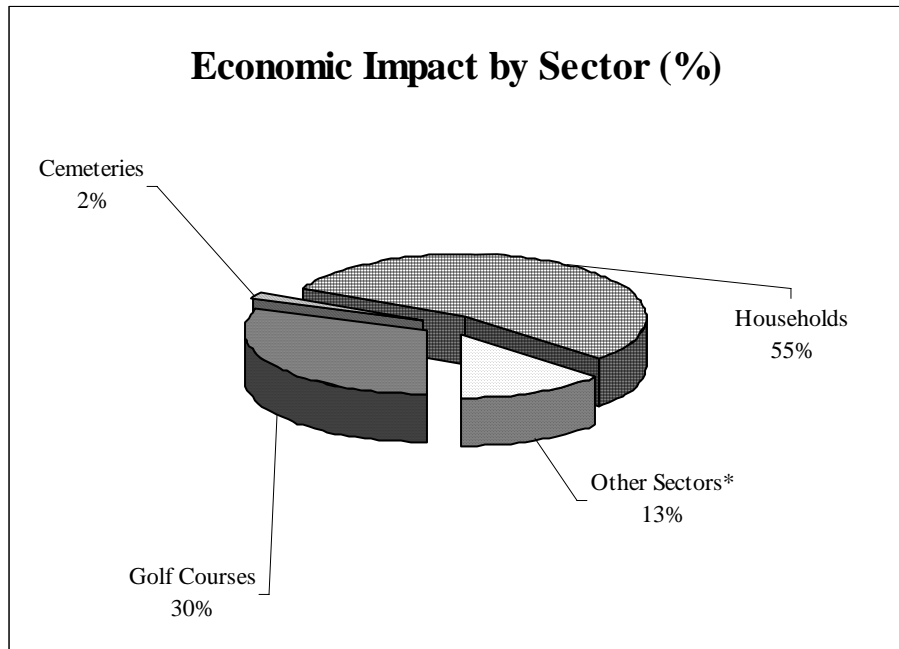
Results of the study revealed that the turf industry contributed \$3.2 billion (see Table 1 and Figure 1) to the New Jersey economy and provided 53,588 jobs. In addition, turfgrass is a major land use in New Jersey, accounting for 890,425 acres (see Table 2) and making up 19% of the State's total land area.

**Table 1. Impacts of Turfgrass Sectors on the New Jersey Economy (\$ millions)**

		<b>Direct Impact</b>	<b>Indirect Impact</b>	<b>Total Impact</b>
<b>Turfgrass Businesses</b>	<b>Sector</b>			
	Sod Farms	41.4	17.7	59.1
	Service Providers	727.1	586.4	1,313.5
Total Impact of Turfgrass Businesses		768.5	604.1	1,372.6
		<b>Direct Impact</b>	<b>Indirect Impact</b>	<b>Total Impact</b>
<b>Turfgrass End-Users</b>	<b>Sector</b>			
	Golf Courses	573.3	409.2	982.5
	Cemeteries	40.4	20.5	60.9
	Households	1,052.1	697.1	1,749.3
	Other Sectors*	272.0	157.1	429.1
Total Impact of Turfgrass End-Users		1,937.8	1,283.9	3,221.7

\* Includes parks, schools, houses of worship, airports, highways, and businesses.

**Figure 1. Distribution of Economic Impacts from Turfgrass Expenditures on the New Jersey Economy**



\* Includes parks, schools, houses of worship, airports, highways, and businesses.

**Table 2. Turfgrass Area by Sector**

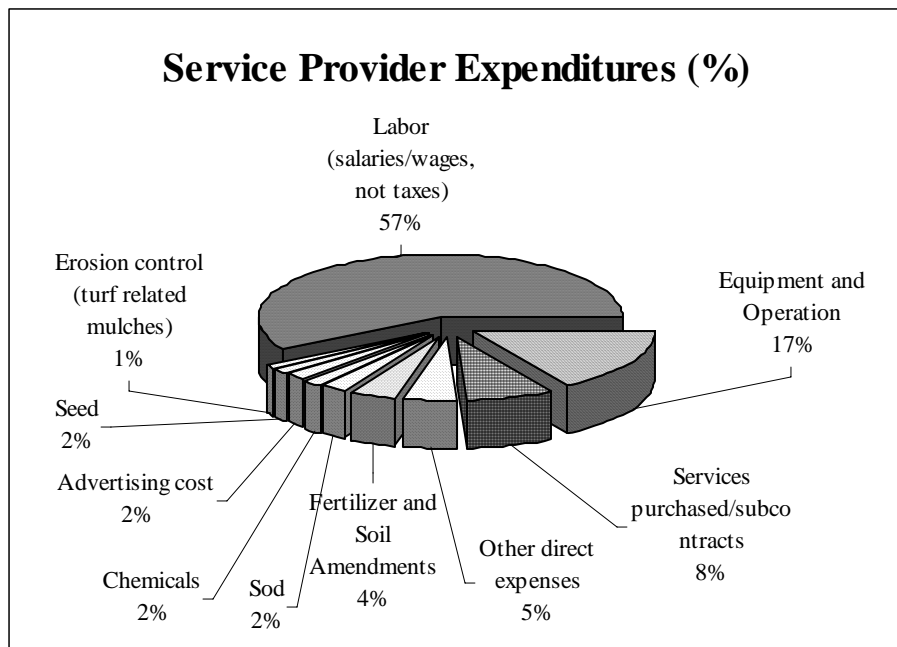
<b>Sector</b>	<b>Turf Area (acres)</b>
Households	665,675
Other Sectors*	171,376
Golf Courses	23,374
Cemeteries	22,000
Sod Farms	8,000
<b>Total</b>	<b>890,425</b>

\* Includes parks, schools, houses of worship, airports, highways, and businesses.

## Service Providers

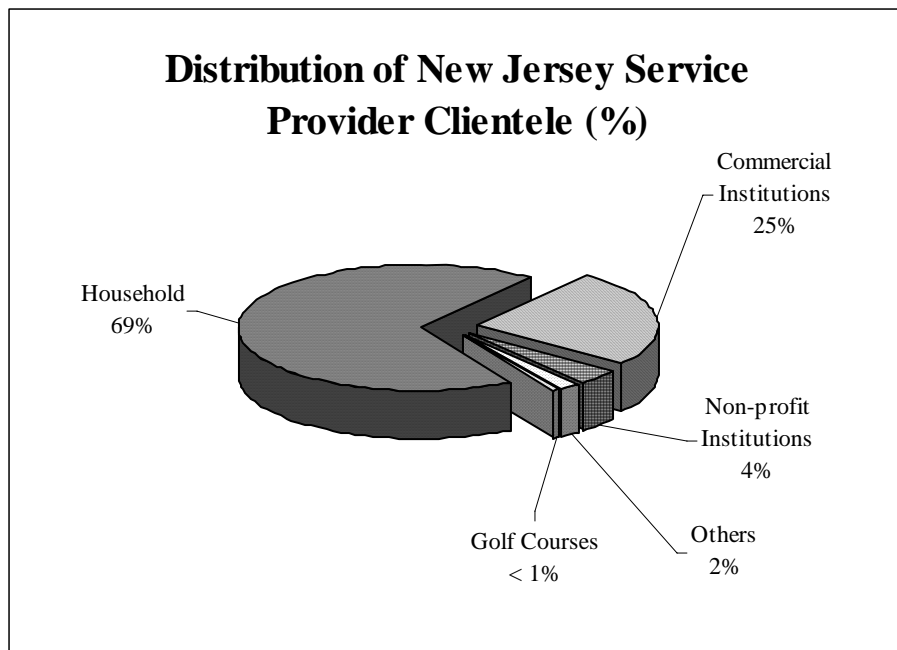
In 2001, New Jersey’s 2,442 turfgrass service providers serviced an estimated 348,742 acres of turf, directly employed 21,335 workers, provided an estimated \$400 million in payroll and benefits, and generated an additional 5,741 jobs in related industries through indirect and induced impacts. New Jersey turfgrass service providers spent an estimated \$691 million on cash expenses (i.e., labor, equipment, fertilizer and soil amendments, chemicals, seed, sod, and advertising) in 2001. See Figure 2 for a percentage breakdown of turf-related expenditures.

**Figure 2. Distribution of New Jersey Service Provider Turfgrass Expenditures**

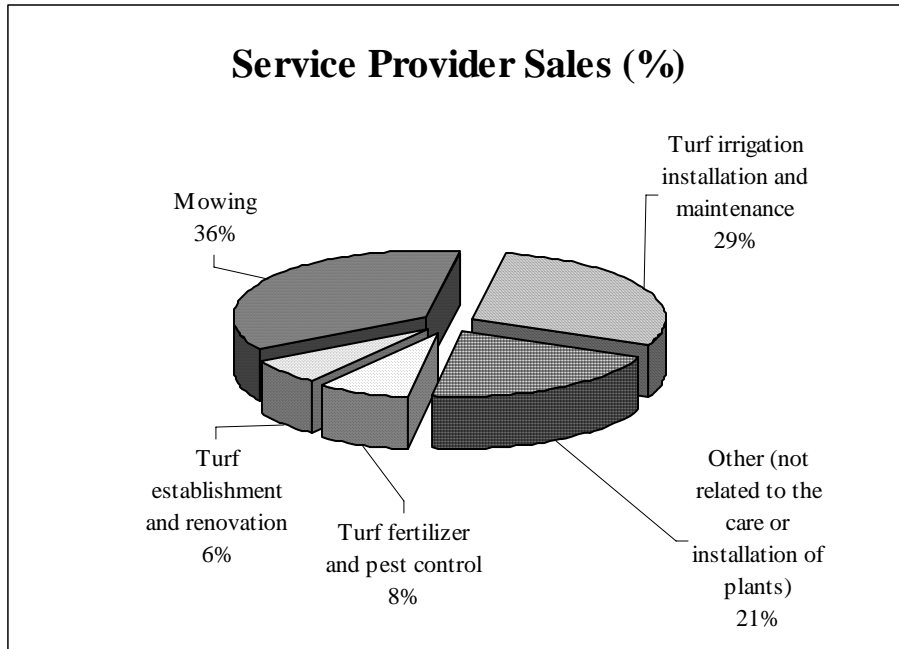


In terms of revenues, New Jersey service providers generated an estimated \$1.3 billion in total output in 2001; of that total, \$727 million was turf-related output generated directly by turfgrass service providers, while \$586 million was generated by related industries and households. In addition, New Jersey service providers billed \$618 million for ornamental planting and maintenance services. Moreover, service providers generated an estimated \$874.1 million in turf-related value added, of which \$510.1 million was directly generated through turf-related activities. Turf-related assets reported by New Jersey's service providers were estimated at \$486 million. Sixty-nine percent of surveyed service providers' business comes from residential properties while 25% is from commercial properties (see Figure 3). Furthermore, 70% of service providers indicated that residential properties were the fastest growing part of their business.

**Figure 3. Percentage Distribution of New Jersey Service Provider Clientele**



Fertilizer and pesticide applications represent 8% of service provider revenues; however, 81% of service providers indicated that they do perform some form of Integrated Pest Management (IPM) on their clients' turfgrass at least some of the time. Figure 4 shows the distribution of New Jersey service provider sales by type of activity.



**Figure 4. Percentage Distribution of New Jersey Service Provider Sales**

Service providers established 12,210 new acres of turf (65% for seed and 35% for sod) in New Jersey during 2001. The most common species of turfgrass maintained by service providers were Kentucky bluegrass, perennial ryegrass, and tall fescue.

The most commonly cited turfgrass problems were water-related issues (both lack of water and too much water), weeds, and poor soil. Other difficult problems faced by service providers were regulatory water restrictions and labor availability. Although seventy-three percent of respondents cited labor availability as a problem and 75% believe it will continue to

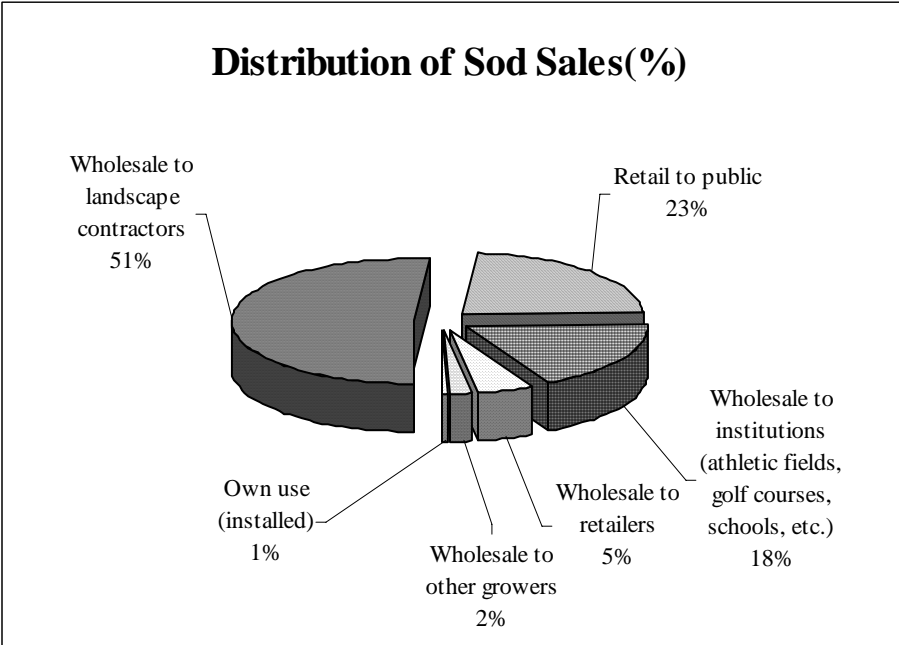


be a problem in the future, water restrictions was the most commonly cited problem. In fact, 94% of respondents believe that water restrictions have adversely affected their business and will likely continue to do so in the future. In actuality, there was only one major drought during the past five years, with State mandatory drought restrictions occurring for 2 months in 1999. In total, it was estimated that service providers lost \$150 million in revenue and laid off 3,956 full time employees during the drought of 1999.

## **Sod Producers**

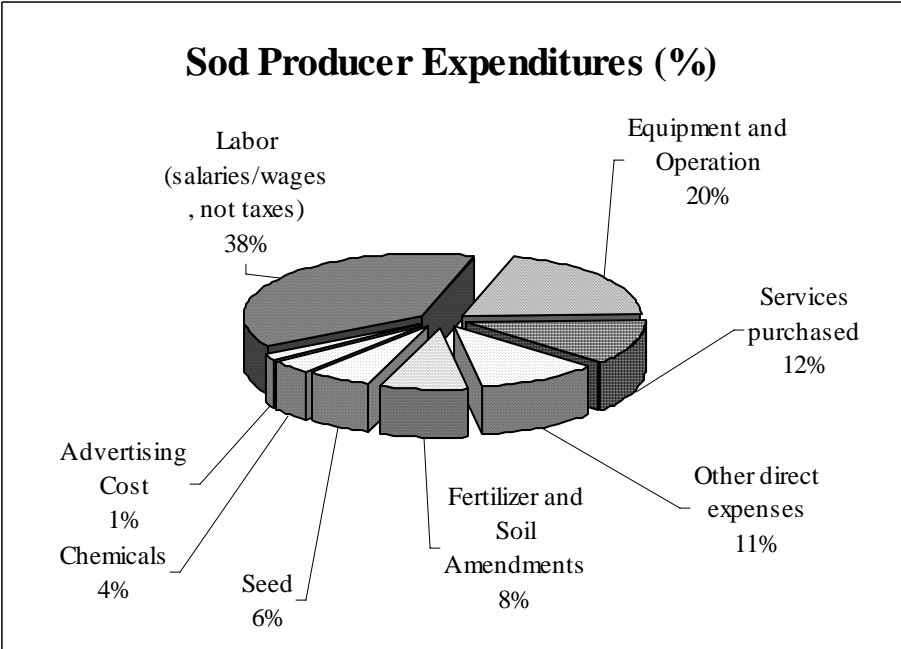
New Jersey's 28 sod producers grew an estimated 8,960 acres of turf in 2001, compared to 5,500 acres in 1983. The sod producer sector employed 364 workers, providing an estimated \$13.2 million in payroll and benefits in 2001. The majority of sales by New Jersey sod producers are wholesale to landscape contractors, retailers, and institutions; however, an estimated 18% of sales are retail to the public. In terms of revenues, it was estimated that New Jersey sod producers billed \$46.4 million for sod in 2001. Figure 5 displays the distribution of sod sales for New Jersey sod producers by type of customer. Multiplier analysis estimated the total economic impacts of New Jersey sod farms in 2001 (including impacts of sod farms on other related industries and households) to be \$66.2 million in output impacts, \$51.6 million in value-added, and 537 jobs created.

**Figure 5. Distribution of Sod Sales by New Jersey Sod Producers**



New Jersey turfgrass sod producers spent an estimated \$34.7 million on cash expenses in 2001; Figure 6 shows the distribution of those expenditures.

**Figure 6. Distribution of New Jersey Sod Producer Expenditures**



Sod producers established an estimated 677 new acres of turf in New Jersey during 2001. The most common species of turfgrass among sod producers were Kentucky bluegrass and tall fescue. It was estimated that 82% of sod produced in New Jersey is Kentucky bluegrass.

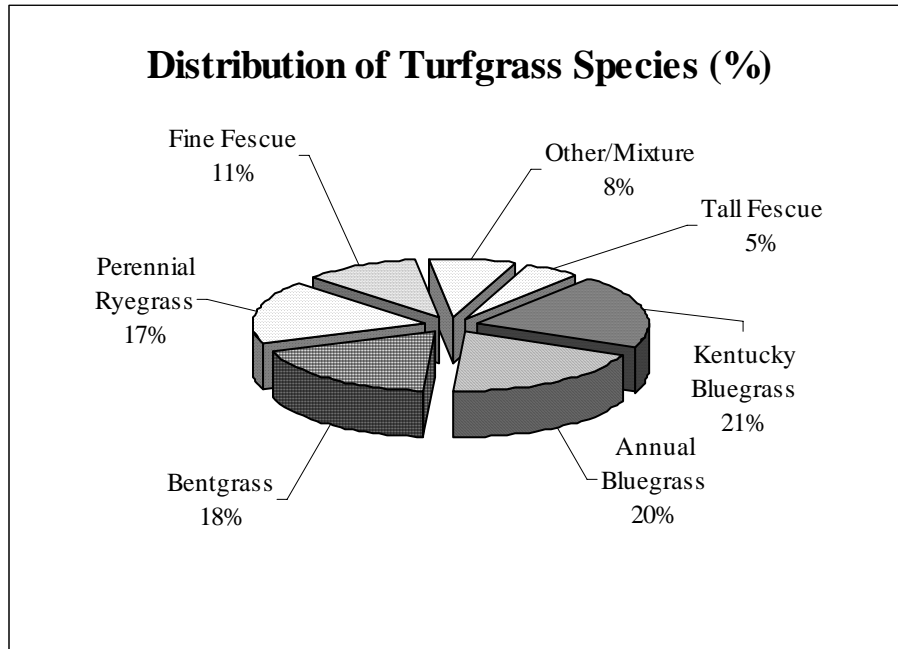
Sod producers reported that the most challenging current issues facing their industry include water restrictions and water availability. All of the survey respondents listed the potential threat of water restrictions as a major challenge to their industry in the future. Moreover, 89% of respondents indicated that they had been affected by water restrictions during a time of drought within the past 5 years. There was one major drought during this five-year period with State mandatory drought restrictions occurring in 1999. Since those water restrictions allowed sod producers to continue to irrigate as a course of their business, the bulk of the impacts occurred as a decline in the demand for sod, and hence, decreased revenues. In total, it was estimated that sod producer's revenues decreased by approximately 5% (\$2.3 million) due to the drought. Other challenges facing the New Jersey sod industry include labor availability and immigration laws. Fifty-six percent of respondents listed immigration laws as major challenge to their industry and 44% said labor availability was a current problem.

## **Golf Courses**

In 2001, New Jersey's 289 golf courses maintained a total estimated land area of 38,093 acres, of which 23,374 acres were covered with turfgrass. The average area per golf course was 131.8 acres. Kentucky bluegrass and annual bluegrass were the most common turf species present on New Jersey golf courses, accounting for 20.4% and 19.8% of turf area, respectively (See Figure 7). In addition, bentgrass could be found on 18.4% of the turf area on New Jersey golf courses. The three most commonly cited turfgrass problems were disease,

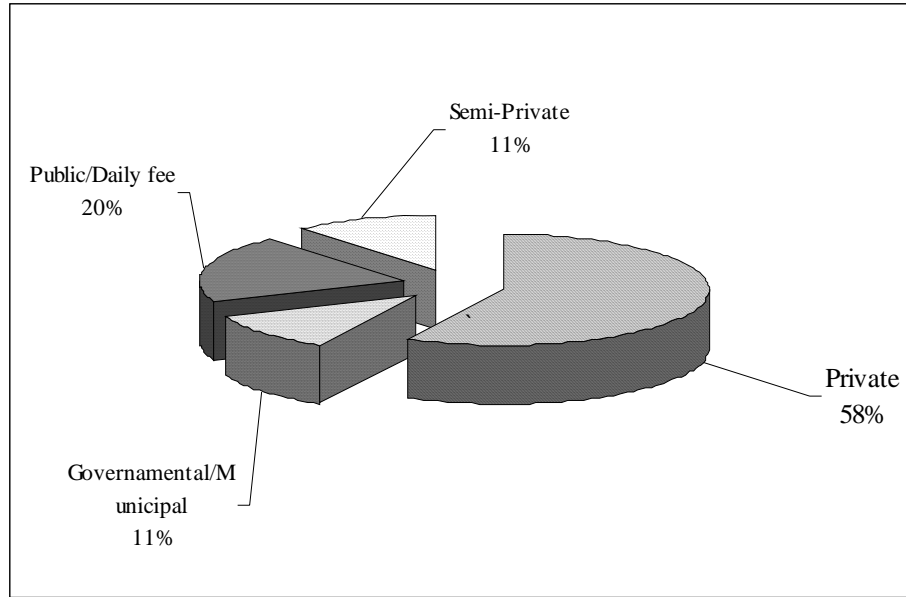
traffic (i.e., wear of turf and compaction of soil), and water issues (i.e., either lack of water or too much water).

**Figure 7. Distribution of Turfgrass Species on New Jersey Golf Courses**



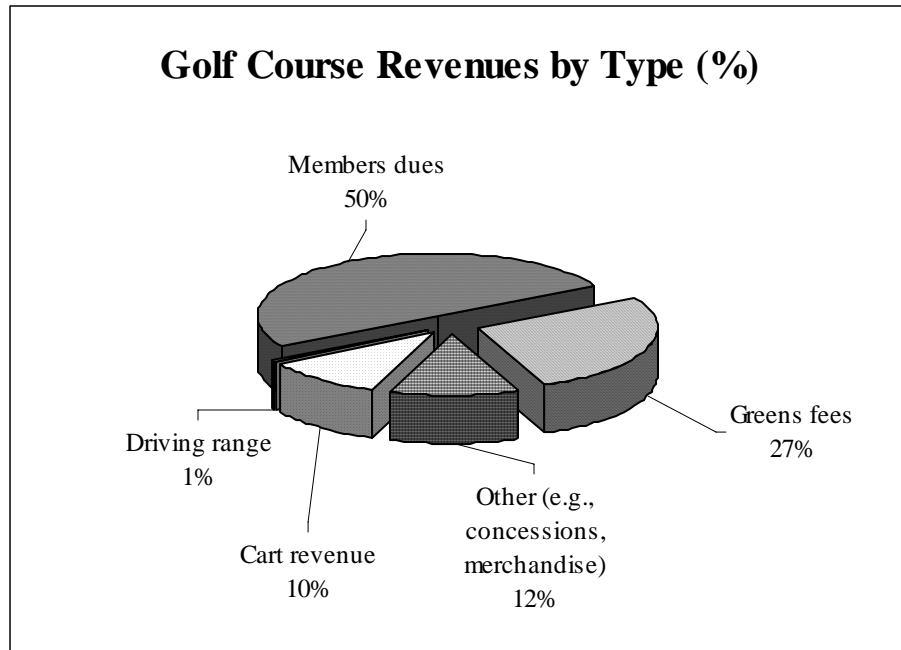
As Figure 8 shows, 58% of the golf courses surveyed were private courses, 20% were public, 11% were semi-private, and 11% were government/municipal courses.

**Figure 8. Distribution of Golf Courses in New Jersey by Type**



There were an estimated 8.9 million rounds of golf played on 18-hole courses in New Jersey in 2001. That equates to an average of 31,108 rounds played per course. In addition, it was estimated that 3.6 million rounds were played on 9-hole courses the same year; an average of 12,542 rounds per course. Golf course revenues in 2001 were estimated to be \$573 million or 1.9 million per course; 77% of that total was generated from greens fees and member dues, with the balance coming from concessions, merchandise, cart rental and driving range fees (see Figure 9). Economic impact analysis estimated an additional \$409 million of output through indirect and induced impacts (i.e., revenue generated in other related industries) for a total estimated economic impact of \$982 million in the State. Furthermore, New Jersey golf courses employed 14,450 workers in 2001.

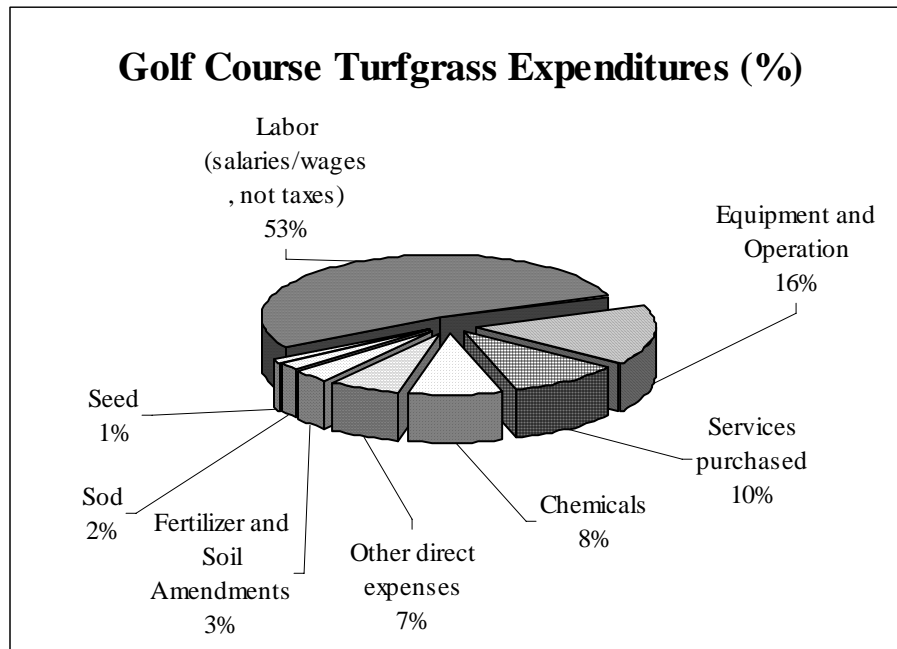
**Figure 9. Distribution of Revenues by New Jersey Golf Courses**



Another measure of economic impact is “value added”. New Jersey golf courses generated an estimated \$361 million in value added in 2001, and an additional \$251 million of value added through indirect and induced impacts (i.e., value added generated in other related industries) for a total estimated value added impact of \$612 million in the State.

In terms of expenditures, New Jersey golf courses spent an estimated \$237 million on turf maintenance during 2001. The estimated average expense per golf course was \$821,319. Labor accounted for the largest share of the total expenses at 52.9%. Equipment costs made up 15.7% of the total, while services purchased accounted for 10%, chemicals 8.5%, and fertilizer and soil amendments 3.3% of the total maintenance expenses (see Figure 10).

**Figure 10. Distribution of New Jersey Golf Course Expenditures**



The surveys posed a number of questions regarding the effects of drought on New Jersey Golf courses. Ninety-six percent of respondents reported being affected by water restrictions during the past five years. Eighty-two percent of respondents experienced damage to turf, 72% experienced damage to trees, 67% experienced damage to shrubs, and 52% experienced damage to herbaceous annuals and perennials. In addition, golf courses reporting decreased revenues during times of drought. In total, damage associated with drought cost New Jersey golf courses an estimated \$20.2 million within the past five years. In actuality, this is the estimated cost of a single drought that occurred during 1999.

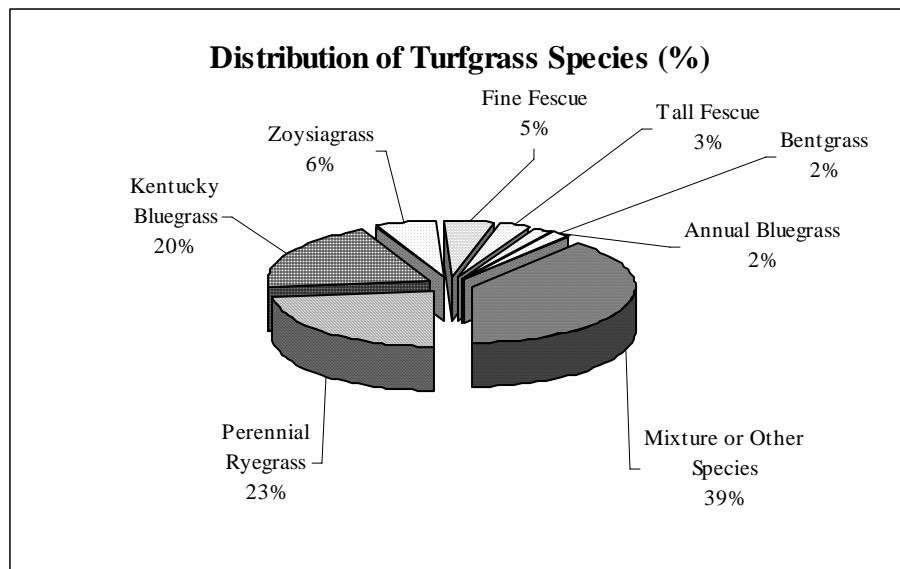
New Jersey golf course managers believe that water-related issues will continue to be important during the next five years. Other important issues that golf course managers believe to be facing the industry in the near future are the availability of labor and regulations on pesticide applications.

## Cemeteries

New Jersey's 1,100 cemeteries maintained a total estimated land area of 23,650 acres in 2001, of which 22,000 acres was turfgrass. The estimated average turf area per cemetery was 20 acres.

It was estimated that 39% of the acreage in New Jersey cemeteries was mixture of different turf species. Perennial ryegrass made up 23% of the turfgrass in New Jersey cemetery turf area and Kentucky bluegrass accounted for 20% (see Figure 11). The three most commonly cited turfgrass problems were weeds, water (i.e., lack of water or too much water), and poor soil.

**Figure 11. Distribution of Turfgrass Species among New Jersey Cemeteries**

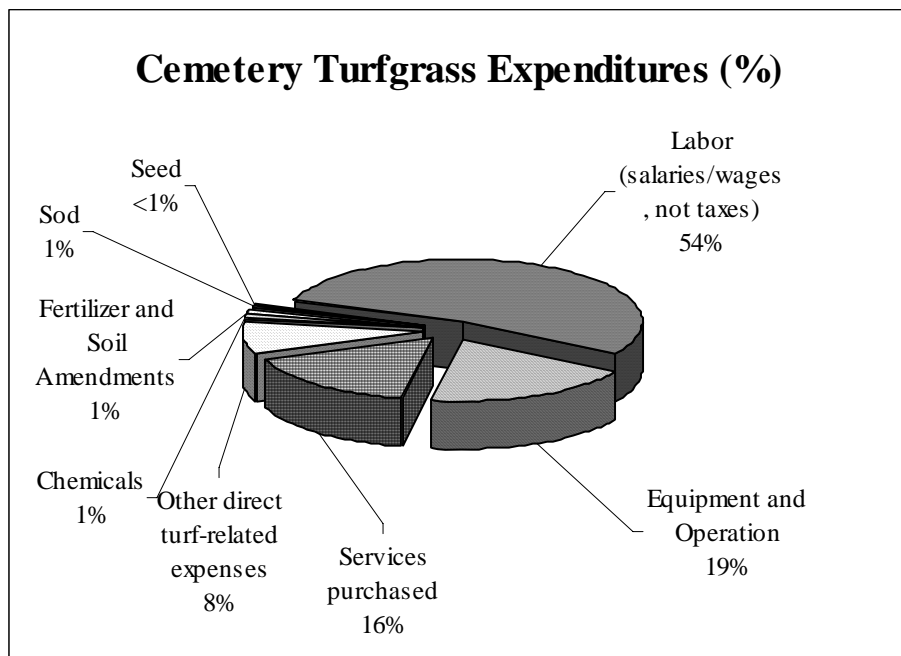


In terms of expenditures, New Jersey cemeteries spent an estimated \$42,235 per cemetery on turf-related expenses in 2001. This equates to a total of \$46.5 million in turf-related expenses for all New Jersey cemeteries; Figure 12 provides a distribution of New Jersey cemetery turf-related expenditures. The average estimated expense per acre of turf was \$2,112. The total impact (including indirect and induced impacts) on the state's economy generated from those



expenses was estimated to be \$60.8 million. In addition, \$17.1 million in value added dollars was generated in the State through the indirect and induced impacts from turf-related expenditures of cemeteries in 2001. New Jersey cemeteries experienced an estimated 6.6 million in losses due to drought damaged turf and ornamental plantings in 1999, the year of the last major drought in New Jersey.

**Figure 12. Distribution of New Jersey Cemetery Turfgrass Expenditures**

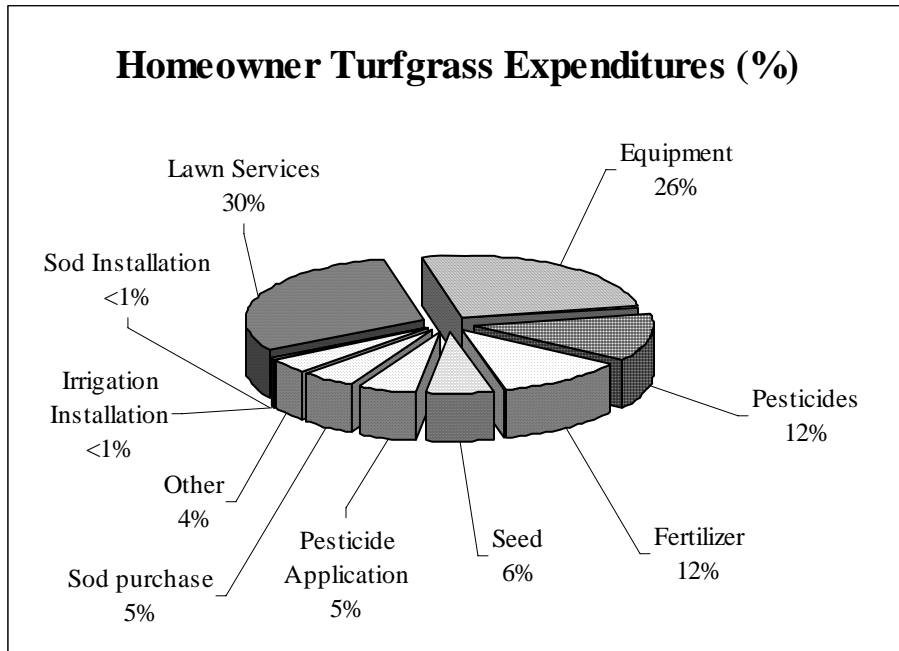


## Home Lawns

In 2001, New Jersey's single-family homeowners maintained a total of 665,675 acres of turf. The average lot size for a single-family home was 0.70 acres while the average turf area per home was 0.32 acres. New Jersey homeowners spent approximately \$1 billion (excluding unpaid labor) on turf maintenance during 2001. Professional lawn-care services accounted for the largest share of this expense (30%), followed by equipment costs (26%) (see Figure 13). On

average, single-family homeowners spent approximately \$506 on turf maintenance each year. The total impact (including indirect impacts on other industries) generated from turf maintenance expenditure on home lawns was estimated at \$1.7 billion in 2001.

**Figure 13. Distribution of Turf-Related Expenses for NJ Single Family Homes**

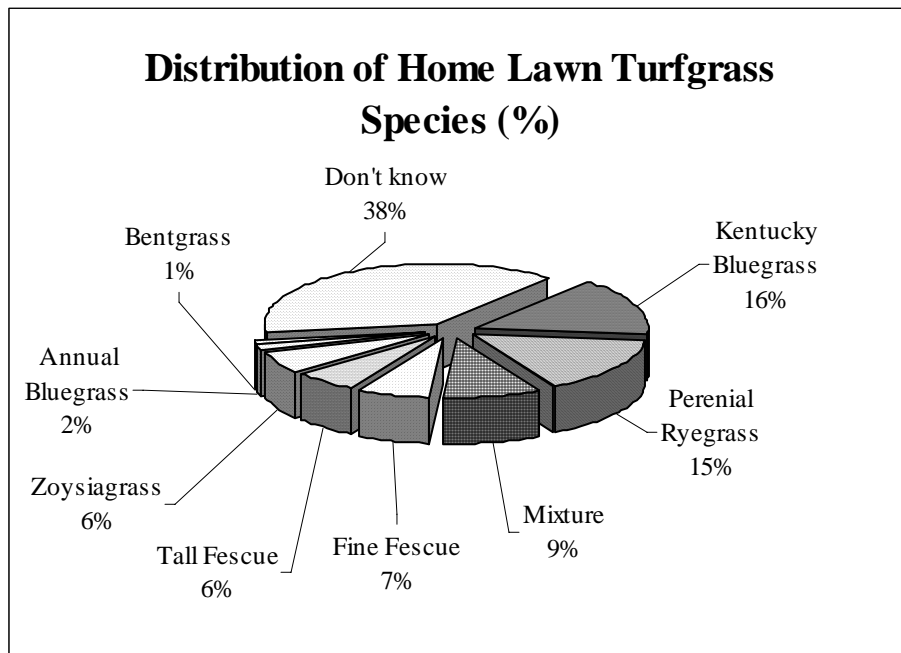


New Jersey homeowners also spent an estimated \$1.2 billion on ornamental plantings and maintenance during 2001. Of the total, \$539 million was spent on new plantings and \$732 million was spent on existing plant maintenance. The average annual expenditure for new ornamental stock was \$259. Flowers accounted for the largest share of new ornamental expenses (42%), followed by shrubs (37%) and trees (17%).

Kentucky bluegrass and perennial ryegrass were the most popular turf species grown by New Jersey homeowners. However, the majority (58%) of the respondents did not know what type of grass was growing on their property (see Figure 14). The three most challenging turf-related problems for homeowners were weeds (65% indicated that controlling weeds was a

difficult problem), lack of available water during periods of drought (37%) and damage from insects (36%). Thirty-three percent of homeowners left clippings on their lawns, while others (16%) composted this waste. Only eight percent disposed of turf clippings in the trash. Of the homeowners who mowed their own lawns, fifty five percent utilized a mulching blade. Over 2/3 of New Jersey homeowners water their lawns, but only 27% use automatic or manual irrigation. Sixty-eight percent rely on municipal water to irrigate their turf and ornamentals.

**Figure 14. Distribution of Turfgrass Species among New Jersey Home Lawns**



The surveys posed a number of questions regarding the effects of drought on home grounds. The results showed that seventy-seven percent of New Jersey homeowners have been affected by water restrictions during periods of drought within the past five years. Thirty-nine percent indicated that they suffered economic damage (i.e., loss of grass, shrubs, trees, etc.) due to the drought in 1999. There was one major drought during this five-year period (1999), with State mandatory drought restrictions occurring for two months during the growing season. Even

so, the average cost of damage to lawn and ornamental plantings during the drought of 1999 was estimated at \$261, and the total economic cost of the drought to New Jersey homeowners was \$212 million. Had drought restrictions persisted, or had they been more restrictive, the impact of the drought on homeowners in the State would have been even more pronounced.

The turf industry plays an important role in New Jersey's economy and in the everyday lives of New Jersey's residents. Most of the homeowners surveyed (90%) believed that an attractive lawn and landscape increased the value of their homes. Sixty-five percent believed an attractive lawn and landscape can add at least 10% to the value of their homes. Furthermore, 60% of homeowners believed that turfgrass represents a healthy environment.

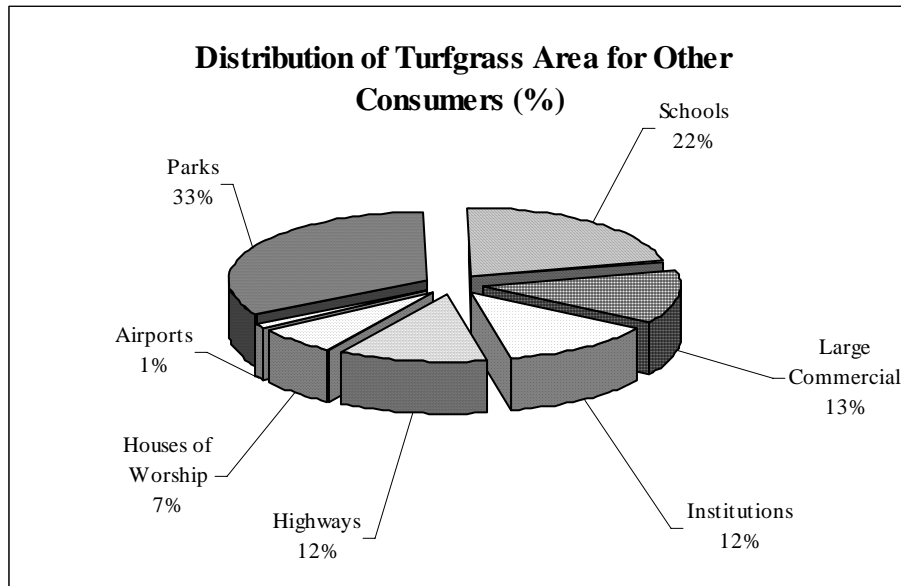
## **Other Turfgrass Consumers**

For purposes of the study, this group of turfgrass consumers includes parks, schools, houses of worship, institutions, airports, highways/roadsides, and all commercial establishments. The estimated total turf area for other turfgrass consumers in New Jersey was 160,533 acres in 2001 and the total annual turf-related maintenance costs were estimated at \$272 million; this translates to average per acre maintenance costs of \$1,694. Including the indirect and induced impacts of turfgrass expenditures brings the total economic impact to an estimated \$429.1 million (see Table 3). Figure 15 provides the distribution of turf area and Figure 16 provides the distribution of turf-related expenditures among the different sectors included in the Other Consumers category.

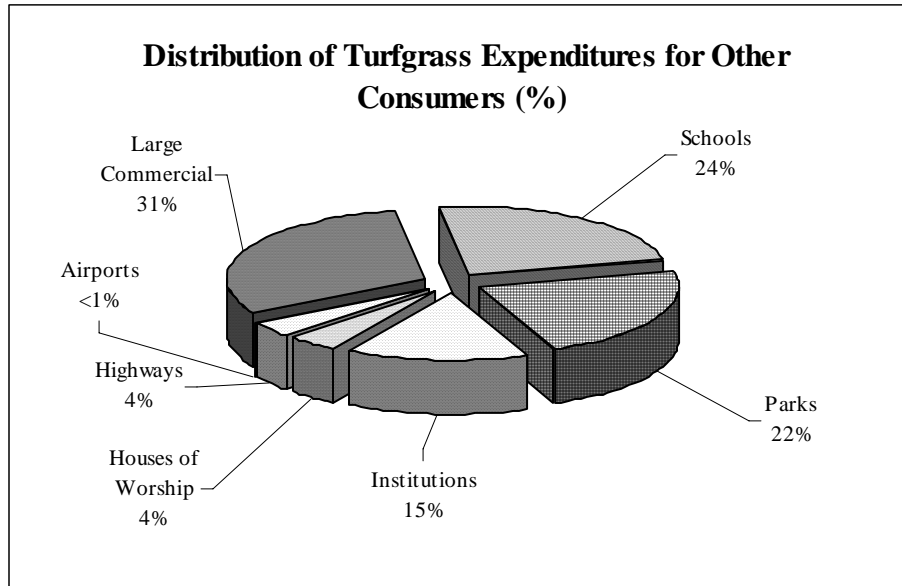
**Table 3. Turf Statistics for Other New Jersey Turfgrass Consumers in 2001**

<b>Item</b>	<b>2001 Estimate</b>
Total turf area (acres)	160,533
Average maintenance cost per acre (dollars)	\$1,694
Total turf maintenance expenditures (million dollars)	\$272.00
<u>Total economic impact w/ induced and indirect impacts (million dollars)</u>	<u>\$429.10</u>

**Figure 15. Distribution of Turfgrass Area by Sector for Other Consumers**



**Figure 16. Distribution of Turfgrass Expenditures by Sector for Other Consumers**



Following are the results of the study for each segment of the “Other Turfgrass Consumers” sector.

### ***Parks***

There were 17 county park systems and 96 state parks and historical sites in 2001. In addition, it was estimated that there were 3,220 municipal parks in 2001. The total turf area for all parks in New Jersey was estimated at 53,094 acres. This estimate includes park turfgrass utilized for all purposes including athletic fields. In terms of expenditures, turf maintenance expenditures for New Jersey parks were estimated to be \$53 million in 2001. This equates to average turf maintenance expenditures of \$1,000 per acre of turf.

## ***Schools***

Schools maintain turfgrass for aesthetic purposes as well as athletic fields for children. According to the New Jersey Department of Education, there are 3,528 schools in New Jersey. These schools maintained an estimated 35,280 acres of turf in 2001. Estimated turf maintenance costs for New Jersey schools totaled \$56.4 million. The average cost for maintaining turf on school grounds was \$1,599.

## ***Houses of Worship***

Churches, synagogues, temples and other houses of worship maintain areas of turfgrass for aesthetic purposes. In addition, some houses of worship utilize turfgrass on playgrounds for children. There were an estimated 6,785 houses of worship in New Jersey. These houses of worship maintained an estimated 10,517 acres of turf in 2001. Estimated turf maintenance costs for New Jersey houses of worship totaled \$10.2 million. The average cost for maintenance of one acre of turf was \$974.

## ***Institutions***

This group of public and private sector institutions includes colleges, universities, correctional facilities, and hospitals. It was estimated that there are 196 such institutions in New Jersey. As Table 4 shows, these institutions maintained an estimated 19,992 acres of turf in 2001. Estimated turf maintenance costs for New Jersey institutions totaled \$34.6 million. The average cost for maintenance of 1 acre of turf was \$1,730.

### ***Airports***

According to the New Jersey Aviation Association, there are 50 airports in New Jersey. These airports maintained an estimated 2,000 acres of turf in 2001. Estimated turf maintenance costs for New Jersey institutions totaled \$126,000. The average cost per acre for turf maintenance was \$63.

### ***Highways/Roadsides***

New Jersey maintained an estimated 19,650 acres of turf on its highways in 2001. Estimated turf maintenance costs for New Jersey highways totaled \$8.9 million. The average cost per acre for turf maintenance was \$451.

### ***Commercial Establishments***

Commercial establishments include all New Jersey businesses (e.g., banks, malls, motels, etc.). There were approximately 213,667 establishments in New Jersey. These commercial establishments maintained an estimated 30,683 acres of turf in 2001. Estimated turf maintenance costs for New Jersey commercial establishments totaled \$108.6 million. The average cost for maintenance of 1 acre of turf was \$3,541.

## **Summary**

This study evaluated the size and scope of the turfgrass industry in New Jersey. There were many findings in this report that document the importance of turfgrass to the State's economy. Results of this study show that the turfgrass industry contributes more than \$3 billion



to the economy of New Jersey and provides 53,588 jobs. Moreover, turfgrass is grown on 890,425 acres, accounting for 19% of the State's total land area.

In summary, the turfgrass industry plays a very important role in the State's economy and in the everyday lives of New Jersey residents. Furthermore, New Jersey turf-related businesses provide valuable services to turfgrass users and serve as an economic stimulus to the economy of this highly urbanized state.