DEPARTMENT OF AGRICULTURAL, ENVIRONMENTAL, AND DEVELOPMENT ECONOMICS

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Report of

2005 OHIO LANDSCAPE & NURSERY ECONOMIC IMPACT STUDY

This research was conducted in The Ohio State University Department of Agricultural, Environmental, and Development Economics for Mr. Bill Stalter, Executive Director and the Board of Directors of the Ohio Nursery & Landscape Association

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CONTENTS

STUDY SUMMARY

A survey entitled "Ohio Landscape & Nursery Economic Impact Study" (a.k.a. "Green Industry Survey") was conducted from February 2006 to June 2006 to attempt to document the economic size and importance of Ohio's nursery and landscape industry in 2005. This study was designed to measure changes in the industry from similar previous studies. It slightly modifies the design of a 2001 study by Gary Gao, John Smith and Jim Chatfield which followed the methodology established by Tim Rhodus & Jim Hoskins in 1996, 1992, and 1988. This project was undertaken with the financial support of the Ohio Nursery and Landscape Association (ONLA) with the support of The Ohio State University Extension Nursery, Landscape and Turf Team. Research was conducted through the OSU Department of Agricultural, Environmental, and Development Economics The list of licensed nursery dealers and nursery producers was provided by the Ohio Department of Agriculture (ODA).

Based on our survey results, we estimate the value of all sales by certified nursery stock dealers and producers in Ohio was **$4.13 billion** for 2005. The annual growth rate was 12.1% between 2001 and 2005. Of this total, approximately **$3.36 billion** was from licensed nursery dealers and **$770.3 million** from licensed nursery producers. Among enterprise sub-sectors of the total population, **Landscape Services** continue to be the high-sales leaders for the industry in Ohio at about **$1.9 billion** for combined Landscape Construction/Installation, Maintenance, and Design sales. Landscape maintenance alone grew 23.3% from 2001 to 2005.

The total number of employees in the nursery industry is still somewhat hard to determine using the existing methodology. However, the trends we saw in 2001 continued in 2005. We projected **241,735** workers employed at some level of the nursery and landscape industry in 2005, with an annual payroll for the industry of nearly **$3 billion.** Mixed enterprises (businesses participating in multiple subsectors, all of which are less than 50% of the total enterprise) are the largest labor demander with the combined landscape enterprises maintaining a strong second position in this study. The nursery and landscape industry contributed an estimated **$491 million** in taxes (property, sales, FICA, and income) in 2005.

Specific data and trend interpretation following previous study guidelines are contained herein. Additional analysis will be conducted using the data set obtained in this project and will be available from the Department of Agricultural, Environmental, and Development Economics. For more information on this report or other aspects of this research, contact Stan Ernst, Ernst.1@osu.edu.

INTRODUCTION

A survey entitled "Ohio Landscape & Nursery Economic Impact Study" (a.k.a. "Green Industry Survey") was conducted from February 2006 to June 2006 to attempt to document the economic size and importance of Ohio's nursery and landscape industry in 2005. This study was designed to measure changes in the industry from similar previous studies. It slightly modifies the design of a 2001 study by Gary Gao, John Smith and Jim Chatfield which followed the methodology established by Tim Rhodus & Jim Hoskins in 1996, 1992, and 1988. This project was undertaken with the financial support of the Ohio Nursery and Landscape Association (ONLA) with the support of The Ohio State University Extension Nursery, Landscape and Turf Team. Research was conducted through the OSU Department of Agricultural, Environmental, and Development Economics The list of licensed nursery dealers and nursery producers was provided by the Ohio Department of Agriculture (ODA).

THE SURVEY POPULATION

Our survey population follows the protocol established in the earlier surveys. It is comprised of Licensed Nursery Dealers and Nursery Producers as established by the Ohio Department of Agriculture. According to the 2005 ODA licensee list, the number of licensed nursery dealers (sell/service nursery material) was 5,467 (80.47% of the total population) and the number of licensed nursery producers (grow nursery plant material) was 1,326 (19.52%). The number of licensed dealers was up about 7% from 2001 licensees and the number of producers down about 16%. The total number of firms contacted for this survey was 3,800 to achieve a 99% confidence level with a sampling error of ± 3% (Salant and Dillman,1994) based on a total population of 6,793 firms. A representative sampling of the total population was ensured by drawing a random sample of 3,040 firms from the list of nursery dealers and a random sample of 760 firms from the list of licensed producers – this corresponds to the relative percentage of each type of firm within the total population.

SURVEY TECHNIQUES

A survey questionnaire was developed in consultation with ONLA and the Extension Landscape, Nursery and Turf Team. Questionnaires were mailed in mid-February 2006 to ensure that firms' year-end 2005 reporting would be considered. A follow-up postcard reminder was the first of March and a second survey instrument mailed to non-respondents in late-March. This process was certified exempt under the OSU Institutional Review Board on human subjects research under federal guidelines. Members of the population were encouraged to communicate with the project leader (Ernst) by phone or E-mail if there were questions or concerns. Surveys were tracked as questionnaires were received from respondents.

These survey techniques are deemed consistent enough with the 1988, 1992, 1996, and 2001 studies. The total sample of 3,800 was considerably higher than the number surveyed in 2001 (n=1,000) and that of previous studies in an attempt to increase the total number of cases observed and improve the representativeness of the respondents.

RESPONSE RATES AND SURVEY RESPONDENTS

This sample size for this survey was 3,800 licensed nursery stock producers and licensed nursery dealers. Firms whose mailings were returned by the postal service were subtracted for an adjusted sample size of 3,643 (14.22% rejection). From that adjusted sample we removed 64 total responses for various reasons (declined to participate, gone out of business, personal gardener that held a license for some non-commercial reason, civic groups who indicated they held certification for non-profit reasons; governmental entities such as Soil and Water Conservation Districts), to yield a useable sample of N=3579. The total adjusted response rate for this survey, based on 469 useable responses, was 13.10%. Nursery producers returned a total of 185 useable questionnaires for a study response rate of 25.03% in that subset. This number of useable questionnaires was more than twice the number collected in 2001. For the subset of licensed nursery dealers, we received 278 useable responses for an adjusted response rate of 9.88%. Further descriptions of responses are shown in Table 1.

Table 1. Response Rates

	Nursery Producers	Dealers	Total Survey
Original sample	760	3,040	3,800
Postal rejects	6	151	157
Adjusted Sample Size	754	2,889	3,643
Total # Response	200	312	*518
Total response rate	26.53%	10.80%	14.22%
Disqualified/unusable	15	34	64
Useable Sample Size	739	2813	3,579
Useable Responses	186	278	469
Useable Response Rate	25.17%	9.88%	13.10%

***includes 6 that can't be classified "Producer" or "Dealer".**

SIZE AND SCOPE OF GREEN INDUSTRY SURVEY POPULATION

VALUE OF NURSERY STOCK SALES

The estimated value of overall sales by licensed nursery stock dealers and producers in Ohio was approximately **$4.13 billion** for 2005 (Table 2). Of this total, about **$3.36 billion** was from licensed dealers and **$770.3 million** from licensed nursery producers. Nursery dealer sales values were determined using methods similar to previous studies –average gross sales reported by survey respondents for each category of nursery sales was multiplied by a factor of 5,467 (total number Ohio licensed nursery dealers), weighted by percentage of firms in that sales category. The estimated value of overall sales for licensed nursery producers was determined in the same way for each category of nursery sales, multiplying average gross sales by a factor of 1,326 (total number Ohio licensed nursery producers).

Table 2. Total Estimated Nursery and Landscape Sales Reported in 2001 and 2005
(note: categories will not add exactly due to rounding)

Category	2001 Dealers (in $1,000s)	2001 Producers (in $1,000s)	2001 Combined (in $1,000s)	**2005 Dealers (in $1,000s)**	**2005 Producers (in $1,000s)**	**2005 Combined (in $1,000s)**
Retail Garden Center	$465,970	$68,871	$534,842	545,913.51	131,235.94	677,149.45
Landscape Construction and Installation	674,428	77,656	752,078	846,964.94	173,203.67	1,020,168.60
Landscape Maintenance	377,071	25,980	403,051	707,726.67	72,341.34	780,068.02
Landscape Design	NA	NA	NA	78,067.45	17,191.40	95,258.85
Wholesale	469,577	364,413	833,990	343,655.82	357,410.57	701,066.38
Other	200,711	62,496	263,207	840,760.82	18,934.92	859,695.73
Total	$2,187,75	$599,417	$2,787,168	3,363,089.21	770,317.83	4,133,407.04

During 2005, sales in Landscape Services in Ohio totaled about **$ 1.9billion** (combined total for Landscape Construction/Installation, Landscape Maintenance, and Landscape design). Landscape design was not reported as a separate line in previous studies. The overall landscape sales were up significantly since 2001. Some of this is likely due to differences in sampling and reporting, however, it is safe to assume considerable sales growth in this area reflecting demand for these services. Retail Garden Center sales totaled **$677.15 million, also showing above average growth.** Wholesale sales were down slightly at **$701.07 million**, mostly on the dealer side. Sales in the “other” category showed significant change, up from $263.2 million in 2001 to **$859.70 million** in 2005. Comments by respondents seem to indicate part of this growth from other agricultural enterprises and some possible reporting conflicts from multi-faceted businesses carrying the licenses. It should be noted that these estimates were acquired with much richer data than previous years and are likely conservative, due to the sales ranges the respondents had to pick from this year. Previous studies had an open-ended request for a specific sales volume. The multiple choice method is known to increase accurate responses. Calculations for sales totals were based on mid-points in the 11 ranges offered with the top selling category stopping at $5 million annual sales (possibly too low). Distribution of responding firms by sales category is shown below.

Chart 1. Licensed Ohio Nursery Producer Gross Sales by Sales Volume Category

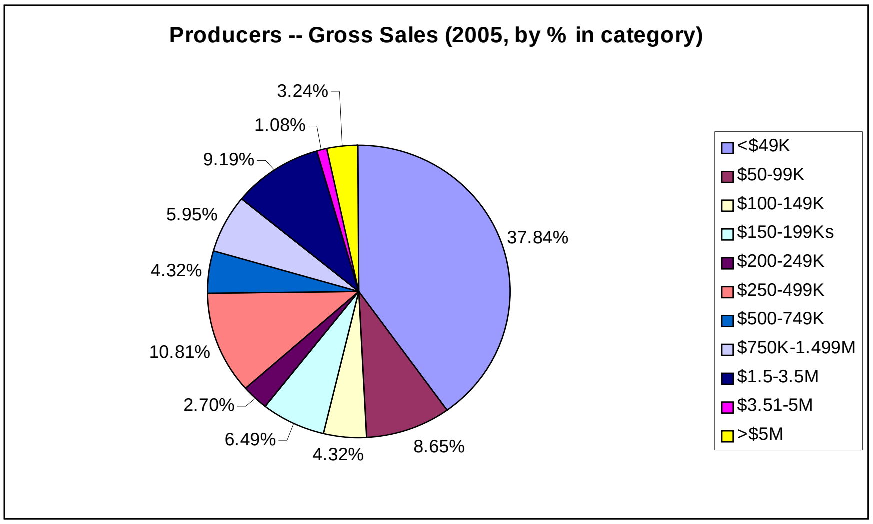
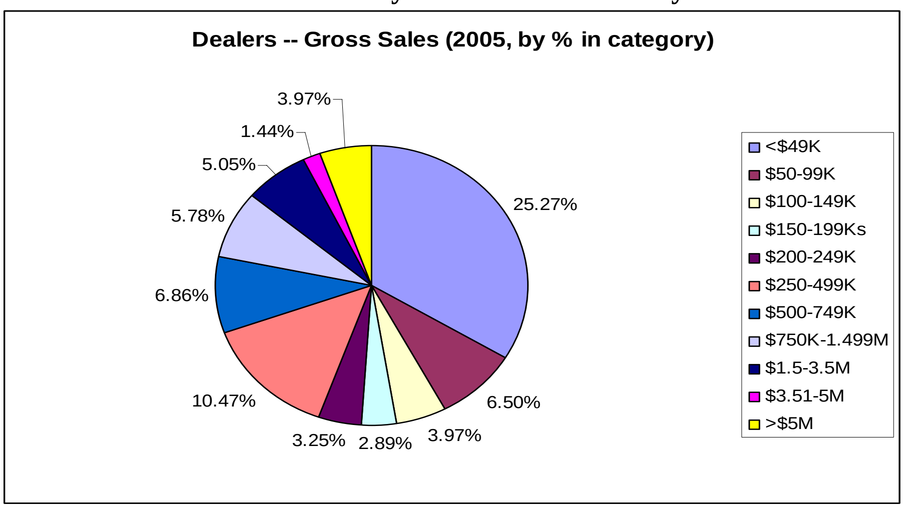


Chart 2. Licensed Ohio Nursery Dealer Gross Sales by Sales Volume Category



Growth in sales between 2001 and 2005 was determined by comparing results of the 2001 Nursery and Landscape Industry Survey to the results of this survey using the prior methodology. Overall, there was an increase of **$1.35 billion**, an increase of 48.3%, over 2001 (Table 3). The annual growth rate was 12.1% over the four years 2001 and 2005. The most significant increase in sales was in the **Other** category which reported growth of 226.6% between 2001 and 2006. This indicates a need for further evaluation of that category to determine new classifications for future studies. **Wholesale sales** dropped for the first time in the history of this study, down about 16% from 2001 and shrinking at nearly 4% annually. Sales in **Landscape Construction/Installation** grew at strong rate of 8.9% annually, but **Landscape Maintenance** showed the greatest sales growth in all categories at 23% per year.

Retail Garden Center sales rebounded in the past four years, according to this data – up 26.6% from 2001. We could speculate that this growth is from continued U.S. economic health during that period and the effect of of world events influencing consumers to spend more “lifestyle dollars” on their home environment rather than travel. A closer look at Retail center sales by dealers and producers in 2001 and 2006 (Table 1) shows significant recovery in producer retail sales. Both groups continued to slide in their wholesale sales.

Table 3. Growth in Nursery Stock and Landscape Sales Between 1988 and 2005

Category	1988 Total (in $1,000s)	1992 Total (in $1,000s)	1996 Total (in $1,000s)	2001 Total (in $1,000s)	2005 Total (in $1,000s)	Percent Change (2001-2005)
Retail Garden Center	$357,371	$435,513	$568,260	$534,887	677,149.45	26.6%
Landscape Construction and Installation	366,140	326,256	585,115	752,130	1,020,168.60	35.6%
Landscape Maintenance	126,705	168,005	360,466	403,068	780,068.02	93.5%
Wholesale	324,928	351,100	315,972	834,230	701,066.38	-15.96%
Other	75,431	322,457	129,786	263,249	859,695.73	226.6%
Grand Total	**$1,250,575**	**$1,603,331**	**$1,959,598**	**$2,787,564**	**4,133,407.04**	**48.3%**

SALES BY FIRM TYPE

Sales by firm type was estimated by categorizing firms by their primary source of revenue. Following prior methodology, firms indicating that 50% or more of their gross sales were generated from a single sales category were classified as specializing in that type of business, otherwise they were considered as "Mixed Enterprise" firms. Data from the current and previous surveys may lead to some level of double counting and additional rounding error. Likewise, the improvements in sampling/reporting made in this survey create problems calculating annual growth since the beginning of this survey in 1992, therefore those rates are omitted and the year-by-year comparisons shown in Table 4 should be used for trend analysis – actual sales estimates are provided in the previous tables. Gross sales for 2001 and 2005, by firm type, are shown in Table 4.

Table 4. Total Sales by Firm Type in 1992, 1996, 2001 and 2005.

Category	1992 Total (in $1,000)	1996 Total (in $1,000s)	2001 Total (in $1,000s)	2005 Total (in $1,000s)
Retail Garden Center	$291,211	$405,844	$559,412	487,881.09
Landscape Construction and Installation	251,921	488,019	535,971	1,044,798.21
Landscape Maintenance	106,756	296,533	401,922	687,239.17
Wholesale	259,531	264,409	664,583	596,418.93
Other	430,168	266,833	76,301	913,497.38
Mixed Enterprise	192,117	237,960	548,979	1,365,261.54

GREEN INDUSTRY LABOR

Survey respondents were asked to identify their total labor payroll for 2005. Based on a straight calculation of the number submitted, the total 2005 payroll for Ohio's nursery and landscape industry is estimated at **$3.12 billion.** This figure represents a major increase from the $883 million reported payroll in 2001, leading to some speculation of reporting differences between the two years. Breaking the total payroll by firm types (according to defined sales specialization) is presented in Table 5. As with the data on income by firm type, there will be some inconsistencies because of existing methodology and rounding error. This creates problems calculating annual growth since the beginning of this survey in 1992, therefore those rates are omitted and the year-by-year comparisons in Table 5 may be used as instruction on existing trends.

Table 5. Total Payroll by Firm Type in 1988, 1992, 1996, 2001, and 2005.
(note: categories will not add exactly due to rounding)

Category	1988 Total ($1,000)	1992 Total ($1,000s)	1996 Total ($1,000s)	2001 Total ($1,000s)	2005 Total ($1,000s)
Retail Garden Center	$ 137,811	$ 100,053	$ 108,212	$86,522	223,800
Landscape Construction and Installation	91,763	97,022	189,607	165,042	493,677
Landscape Maintenance	34,870	35,494	107,178	158,338	408,106
Wholesale Sales	83,170	103,946	100,012	207,541	296,206
Other	17,359	94,550	47,852	17,663	151,394
Mixed Enterprise	84,325	71,842	74,738	247,753	1,349,383
Total	$571,640	$501,472	$659,740	$882,859	2,929,149

Total number of employees reported by our sample of 469 nursery and landscape producer or retail firms in 2005 was 6,210 (Table 6). Using the calculation method applied in 2001, gives us **an estimate of 241,735 employees** in the industry. This is significantly higher than 2001 numbers.

Table 6. Sample and Industry Estimate of 2005 Employment numbers compared to 2001.

Category	2001	2005 Estimated Industry Employment	Total Percent Change (2001-2005)	Annual Percent Change (2001-2005)
Full-Time	32,670	37,887	15.97%	3.99%
Part-Time	19,124	23,493	22.85%	5.71%
Seasonal	44,782	180,355	302.74%	75.68%
Total	96,576	**241,735**	**150.31%**	**37.58%**

Some question does remain about the dramatic difference in estimates from the past two surveys. We speculate that under-reporting in previous years deflated the numbers of people working in this industry. While the 2005 employment estimate may be higher than actual numbers, the relative representativeness of the sample lends credence to speculation of prior under reporting.
For consistent comparisons, we used the estimation method of previous studies. But it is obvious that some adjustments in this approach may be needed if the 2005 level of reporting can be maintained or improved in future studies.

Full-time employees totaled an estimated 37,887 in 2005 (Table 7.) The “Other” sector was the largest employer of full-time workers, with retail garden centers coming next. (“other” consisted of a number of grocery, tree, and construction-type businesses that did not self classify among any of the given categories). **Year-round part-time employees** totaled an estimated 23,493 workers in 2005 (Table 8.). Wholesale and the “other” sector are the largest part-time employers by far with all others holding about the same. An estimated 180,355 **seasonal workers** worked in the landscape and nursery industry in

2005, according to survey estimates. Again, wholesale firms took the majority of these part-time employees. Retail garden centers and mixed enterprise firms were next at just over 11,000 workers each.

Table 7. Total Full-Time Employees by Firm Type in 1988, 1992, 1996, 2001 and 2005 (est)

Category	1988	1992	1996	2001	2005
Retail Garden Center	7,958	6,833	5,198	5,329	4,982
Landscape Construction and Installation	4,876	4,424	8,421	6,704	8,039
Landscape Maintenance	2,270	2,274	4,478	7,779	5,026
Wholesale Sales	6,945	7,139	6,187	5,698	6,474
Other	3,279	6,249	3,550	808	5,200
Mixed Enterprise	4,294	3,574	3,361	6,351	8,166
Total	29,623	30,494	31,651	32,670	37,887

Table 8. Total Number of Part-Time Employees by Firm Type in 1988, 1992, 1996, 2001 and 2005

Category	1988	1992	1996	2001	2005
Retail Garden Center	6,542	3,372	3,911	3,789	3,404
Landscape Construction and Installation	3,300	2,452	3,784	3,857	2,897
Landscape Maintenance	1,539	1,613	2,561	3,458	1,086
Wholesale Sales	1,921	1,986	3,414	4,757	7,039
Other	1,031	2,350	1,581	367	3,013
Mixed Enterprise	2,402	1,798	1,838	2,896	6,054
Total	16,734	13,571	17,437	19,124	23,493

Table 9. Total Number of Seasonal Employees by Firm Type in 1988, 1992, 1996, 2001, 2005

Category	1988	1992	1996	2001	2005
Retail Garden Center	8,468	7,348	7,412	6,324	25,021
Landscape Construction and Installation	7,290	5,032	8,572	10,878	23,203
Landscape Maintenance	3,343	2,799	7,917	7,777	25,108
Wholesale Sales	9,519	22,648	9,784	12,356	47,001
Other	1,770	3,839	2,943	781	54,764
Mixed Enterprise	7,122	3,107	4,336	6,636	5,258
Total	37,503	44,772	41,548	44,782	180,355

TAXES

Ohio licensed nursery dealers and producers paid approximately **$491 million in taxes** (Table 11). They paid **$33.5 million in Property Tax**, **$231.5 million in Sales Tax**, **$243.9 million in FICA tax**, and **$185 million in income taxes**. These levels are generally higher than 2001, the larger sample garnered better reporting overall and it is unclear if there were reporting inconsistencies in previous samples. Employment data may be considered the weakest element of this survey.

Table 11. Taxes paid by Ohio Licensed Nursery Dealers and Producers in 2005

Category	Dealers	Producers	Combined
Property Tax	$26,206,642	$7,356,293	$33,562,935
Sales Tax	$166,369,203	$65,095,491	$231,464,694
FICA (combination of Social security tax and Medicare tax)	$187,099,030	$56,769,096	$243,868,126
Income Tax	$32,994,563	$32,994,563	$185,260,626
Grand Total	$396,426,109	94,591,388	$491,017,496

ADDITIONAL FINDINGS

Landscape and Nursery industry firms in the survey had main decision makers (**managers) who are 49.14 years old** on average. And they generally feel pretty good about the sales progress in the industry. Some 49% of those surveyed thought **gross sales were generally increasing** the past four years and another 34% said sales were about the same. 17.15% of those surveyed felt sales were decreasing. Their operations include an estimated **10,865 acres devoted to container production**, 296,024 acres in field production and another 13,022 acres of greenhouse space. The total estimated **value of land** used for landscape and nursery industry is **$142.5 million.** Another $140.8 million is tied up in **buildings and equipment**.

We queried respondents on the **use of various technologies** in their business. While no previous baseline exists, the findings are of sufficient interest to report. Nearly 95% of the firms use a computer for recordkeeping and accounting functions. About 23.5% have a point-of-sale computer. E-mail is used by more than 71% of the firms and nearly 48% claim the use of the World Wide Web or other Internet applications. Radio Frequency Identification chips (0.26%), satellite information services (10.05%) and barcoding (12.7%) are used by many fewer businesses. Respondents were asked about favorite information and product websites they visit regularly for information. The Buckeye Yard and Garden Line and ONLA landscape plants and perennials booklets were both used by just over 56% of respondents, indicating some preference for “offline” information materials. The websites buckeyegardening.com (27.8%) and webgarden.osu.edu (16.3%) had fewer users among the respondents.

CLOSING COMMENTS

This survey of Ohio certified nursery stock dealers and producers is based on a methodology dating back to the 1980s. As such, it has some significant constraints. Problems with the population listings and previous sample size are a concern we tried to address in the 2005 study. The most critical issue in this data is the estimating approaches used. We have maintained the methodology as closely to the previous surveys as possible. However, as seen particularly in the employment data, there are problems that arise as the number of licensees increases, better sampling is done, and the number of useable responses increases because a straight multiplier based on the actual number of the total population is used to extrapolate to the whole industry.

Even with these constraints, we can be reasonably confident the estimated 2005 value of all sales by certified nursery stock dealers and producers in Ohio was **$4.13 billion** with an annual growth rate over 12.1% between 2001 and 2005. Of this total, approximately **$3.36 billion** was from licensed nursery dealers and **$770.3 million** from licensed nursery producers. **Landscape Services** continue to be the high-sales leaders for the industry in Ohio at about **$1.9 billion** for combined Landscape Construction/Installation, Maintenance, and Design sales. Another large category of sales was "Other," at $859 million. This large amount of unclassified sales indicates need for further examination of the business classifications used in this study. The employee numbers and tax-paid levels are also set by formulas similar to the "total sales" approach. We are quite comfortable with the **tax finding of over $491 million** paid in 2005, and with the total payroll estimation of over **$3 billion.**

There is no substitute for better data in making this kind of study. We appreciate the efforts of our team, colleagues at ONLA and in OSU Extension, and those producers and dealers who took the time to give us what we believe is the most comprehensive set of information on this Ohio industry to date.

For more information on Ohio's Nursery & Landscape industry:

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