

maintenance services directory from Australia were reviewed.

The committee decided that production of such a directory would be a great way to market the range of services and professionalism of members and the Landscape Maintenance Association.

Distribution of the Directory was targeted to more than 1,500 potential customers such as property managers, condominium associations, homeowner associations, landscape contractors, land planners and landscape architects. Advertising solicited from allied suppliers was used to defray the majority of production/distribution costs with the remainder borne by listing members.

A solicitation package was prepared by the County Extension Agent which consisted of:

1. A cover letter describing the project and purpose.
2. A Membership Directory Data Sheet
3. A sample Advertising Contract

Bids were sought from several printers and a printer was selected.

Member listing information was prepared in a standardized one-page format. It included name, address, phone number, contact person, service area, and type of clientele served. This was followed by a checked listing of specific services offered.

Advertising was solicited by Directory Committee members for sizes ranging from 1/4 page to full page. Special prices were set for inside back and inside front covers. Deadlines for camera ready copy to the printer were established.

A comprehensive landscape maintenance cultural

calendar was developed by the County Extension Agent. This identified tasks to be performed by the month.

### Results and Discussion

Advertising sold satisfied approximately three fourths of the production and distribution costs with a \$40 assessment to listing members paying for the remainder. A total of 43 ads were sold. Forty-nine landscape maintenance firms prepared listings. Complimentary listings were given to seven allied and two education members. The complete Directory consisted of 68 pages, and 2,000 copies were printed.

The Directory was titled "Who's Who in the Florida Landscape Maintenance Association Tri-County Chapter for 1989-1990."

The cover was two-color with interior pages black and white. Printing was completed by summer of 1989 and distribution began at that time. By fall 1989 more than 1000 copies had been mailed.

Reaction to the Directory has been very favorable. An assessment of the marketing impact of the Directory can be done after the product has been available to potential clientele through at least one complete maintenance cycle. This could occur in 1990. The goals of chapter organizers envision the following results from the Directory:

- (1) Significantly increased business for listing members and advertisers.
- (2) Increased professional stature for the Landscape Maintenance Association with customers.
- (3) Increased chapter membership from practitioners responding to marketing efforts wanting to share in the benefits.

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## DESCRIPTION AND CHARACTERISTICS OF THE LANDSCAPE MAINTENANCE INDUSTRY IN FLORIDA

MICHAEL J. HOLSINGER  
*University of Florida, IFAS*  
*Sarasota County Cooperative Extension Service*  
2900 Ringling Boulevard  
Sarasota, Florida 34237

CLIFF TAYLOR  
*University of Florida, IFAS*  
*Program Evaluation and Organizational Development*  
Gainesville, Florida 32611

J. WALTER PREVATT  
*University of Florida, IFAS*  
*Gulf Coast Research and Education Center*  
5007 60th Street East  
Bradenton, Florida 34203

**Abstract.** In 1988, a 34 county survey was conducted to better describe and characterize the landscape maintenance industry in Florida. The survey was distributed through Florida Cooperative Extension Service channels and by the Florida Landscape Maintenance Association to landscape maintenance practitioners. A total of 535 completed surveys were returned and the results from the 18 questions tabulated and analyzed. A follow up study to develop data from a greater percentage of the client population, particularly in specific metropolitan geographic areas, is identified.

Landscape maintenance is a relatively new term for an age old profession. People have been performing this basic service for many decades. However, the sophistication and technology utilized to maintain the outdoor landscape in more recent years has become substantially more complex and intricate. Thus, the landscape maintenance service performed today can be quite different from that done in the past.

A major reason for the development of a landscape maintenance industry is because many people desire an attractive well-groomed outdoor environment for their leisure and recreational activities. While most people presently perform their own landscape maintenance practices, there are a growing number of people who obtain landscape maintenance services from a commercial firm. Com-

mon explanations as to why these people demand the services of a landscape maintenance firm include they do not have the necessary time, they lack the knowledge or skill to perform various practices, they are limited by physical disabilities or they simply prefer to have someone else perform this type of work.

The landscape maintenance industry in Florida during the last couple of decades has enjoyed significant growth. This growth can largely be attributed to our favorable climate, an increasing population, and increasing per capita incomes. The warm weather and abundant rainfall provide a unique setting to grow numerous horticultural plants. In many areas of central and south Florida, plants are in active growth year round, creating continuous maintenance requirements.

The present size and scope of the landscape maintenance industry in the state is believed to be significant, especially in urban areas with a proliferation of condominiums, part-time residents and rental units. However, concrete data have not been available to define the physical and economic characteristics of this profession.

In 1988, the Landscape Maintenance Association (L.M.A.) was formed as a statewide professional group to represent landscape maintenance firms. L.M.A. officers and members in conjunction with faculty at the University of Florida Institute of Food and Agricultural Sciences (I.F.A.S.) combined efforts to identify the size, scope and educational needs of the industry. This resulted in the design of a survey to begin to measure this important horticultural entity.

#### **Materials and Methods**

The purpose of surveying landscape maintenance practitioners in Florida was to give insight into the development of educational programs to help improve long term prospects for the landscape maintenance profession.

The survey consisted of 18 questions. It was distributed in 1988 to County Extension Directors, Horticulture Agents and the Florida Landscape Maintenance Association. Instructions in the survey precluded duplication of information. After surveys were completed by Landscape practitioners they were returned to I.F.A.S. where a data base was established.

A total of 535 completed surveys were returned and analyzed. Survey responses were received from 34 counties. The counties were Bay, Escambia, Leon, Okaloosa, Citrus, Lee, Manatee, Hillsborough, Pinellas, Sarasota, Alachua, Hendry, Highlands, Osceola, Polk, Brevard, Clay, Duval, Indian River, Palm Beach, Putnam, Gadsen, Gulf, Santa Rosa, Charlotte, Hernando, Pasco, Collier, Marion, Orange, Broward, Dade, Seminole, and Volusia. Respondents reported on their businesses for calendar year 1987.

#### **Results and Discussion**

Significant results are as follows:

1. Seventy-six percent of landscape maintenance practitioners considered their business a full time operation.
2. Sixty-eight percent operated exclusively in one county, with 21% doing business in two counties.

3. Average length of time in business was eight years.
4. Fifty-two percent said they had one to two employees. Twenty-three percent indicated three to five employees and 10% six to ten.
5. Eighty-four percent of the landscape maintenance businesses were independent. Only six percent had branches.
6. Half the businesses maintained total acreage of 25 acres or less.
7. Respondents averaged 2,661 miles for all vehicles per month with average furthest customer 28 miles away.
8. Seventy-seven percent provided services other than landscape maintenance. These included landscape installation, landscape design, and pest control. However, by percent of actual work, 68% was devoted to exterior landscape maintenance, and only 10% to landscape installation, 5% to pest control and 3% to landscape design.
9. The respondents spent 65% of their time on lawn mowing and edging, 14% on pruning, 7% on fertilization, 5% on irrigation and 4% on pest control.
10. The most important source of landscape maintenance information came from other practitioners, with the Cooperative Extension Service rated second.
11. Fifty-one percent valued their equipment at less than \$20,000. However, 15% had equipment worth \$100,00 or more.
12. Fifty-three percent of the businesses indicated they spent less than \$10,000 on operating expenses, while 11% spent \$100,000 or more.
13. Less than \$10,000 was expended by 58% on fixed costs in 1987. Eight percent spent \$100,000 or more on such items.
14. Thirty-five percent had payrolls of less than \$10,000, 17%—\$10,000-\$20,000, 14%—\$20,000-\$40,000 while 18% paid out \$100,000 or more annually.
15. Eighteen percent of landscape maintenance operations reported incomes of less than \$10,000, 14%—\$10,000-\$20,000, and 17%—\$20,000-\$40,000, but 28% generated revenues of \$100,000 or more.

Survey data as reported show that many practitioners lost money in 1987. The average amount of money used to conduct a business in 1987 was \$129,000, while the average income was \$106,000.

#### **Observations and Implications**

While the survey gathered information from a very small percentage of landscape maintenance firms doing business in Florida some conclusions can still be drawn.

- Respondents were those who had been exposed to educational or professional resources of the Cooperative Extension Service and/or Landscape Maintenance Association. The significance of reported profit/loss figures depends on the economic health of all the businesses including those not exposed to these resources.
- Since so many respondents rated the Cooperative Extension Service second to other practitioners as an information source, the need for greater I.F.A.S. educational programming efforts targeted toward landscape maintenance practitioners is evident.

- Follow-on survey efforts could be concentrated in urbanized locations such as Tampa Bay, Orlando, and Miami to obtain data from a higher percentage of the commercial landscape maintenance population. This will permit a greater degree of confidence in the results when assessing physical and economic conditions of the firms for a given area.
- Greater cooperation with the expanding Landscape Maintenance Association can increase validity of future survey results since it now has chapters throughout the state. The L.M.A., key extension agents/specialists, and college Vo-Tech horticulture educators can be utilized to assess the future educational program needs for the industry.

try. Resulting programs could then be repeated in various urbanizing area of the state. Cooperation on certification efforts should be included.

- The industry needs to improve its professional standing with consumers and its profitability in order to represent a viable career field for professional horticulturists.
- Additionally, survey efforts also need to be completed to accurately measure the total economic impact of the Landscape Maintenance Industry to Florida. If it proves to be as significant as many believe, then the industry could likely benefit from educational programs on cultural and economic subjects and greater political influence.

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## MAHOGANY WEBWORM: DAMAGE EVALUATION AND CONTROL IN NURSERIES AND LANDSCAPE AREAS<sup>1</sup>

F. W. HOWARD  
 University of Florida, IFAS  
 Ft. Lauderdale Research & Education Center  
 3205 College Avenue  
 Ft. Lauderdale, Florida 33314

**Abstract.** Studies were conducted in Florida to evaluate the damage to West Indies mahogany trees, *Swietenia mahagoni* Jacquin, by the mahogany webworm, *Macalla thyrsalis* Walker (Lepidoptera: Pyralidae Epipaschiinae) and to develop control measures for this insect. Complete manual defoliation resulted in a significant reduction in growth of young trees ( $P < 0.05$ ). Young trees naturally infested with light populations of mahogany webworms grew faster than uninfested trees, perhaps because vigorous trees may be attractive to this insect. In Florida, mahogany webworms cause aesthetic damage. A foliar treatment with chlorpyrifos at 0.6 g AI/l was effective in controlling these insects and may be appropriate for nurseries. Azadirachtin diluted in water to 20 ppm and *Bacillus thuringiensis* var. *kurstaki* diluted in water to 9,600,000 i. u./l applied to West Indies mahogany foliage in laboratory tests, inhibited feeding by young mahogany webworms ( $P < 0.05$ ). No clear effect was shown on older larvae. Azadirachtin at the above rate and *B. t.* at double the above rate provided excellent control of mahogany webworms in the field. The latter method may be most appropriate for landscape areas.

The West Indies mahogany, *Swietenia mahagoni* Jacquin (Meliaceae), is native to southern Florida and is one of the most popular shade trees in this area (2). These trees are commonly attacked each spring by the mahogany web-

worm, *Macalla thyrsalis* Walker (Lepidoptera: Pyralidae: Epipaschiinae), caterpillars which shroud many of the young branches and leaves with webbing and consume foliage (1). Although the damage caused by mahogany webworms has not been previously evaluated, many residents find them objectionable and have requested information on how to control them. Reinert and Howard (3) evaluated 16 insecticides against the mahogany webworm under laboratory conditions, reporting that acephate, chlorpyrifos, fenprothrin, and fenvalerate provided 96% or better control.

From my general observations, I hypothesized that the insects usually do not significantly affect tree vigor. If this hypothesis is correct, then the incentive to treat infested trees would be reduced. However, there would still be considerable interest in controlling these insects, because insect damage to nursery plants affects sales, and the general public seems to be more concerned about the nuisance of mahogany webworms and their webbing than any supposed reduction in tree vigor.

In this paper I report the results of four experiments: 1) an evaluation of the effects of defoliation on growth of West Indies mahogany, 2) a field trial of one of the insecticides previously found to be effective against mahogany webworms in laboratory experiments and of potential use in nursery situations, and 3) laboratory and 4) field tests of two materials, azadirachtin, which is an extract of the seed of the neem tree, *Azadirachta indica* A. Jussieu, and *Bacillus thuringiensis*. The latter two materials were selected for potential use in urban landscape situations.

### Methods and Materials

To determine the potential growth impact on trees of defoliation by webworms, observations were made in a planting of 30 West Indies mahoganies propagated in 1982 from locally collected seed and planted one year later 7 m apart on the grounds of the Fort Lauderdale Research & Education Center (FLREC). A fine sandy soil is present at this locality. A wood chip mulch was maintained in a radius of ca. 1 m around each tree and a 3N-5P-9K + micronutrient fertilizer was applied at the rate of ca. 80

<sup>1</sup>This paper reports the results of research only. Mention of a product or trademark name in this paper does not constitute a recommendation or endorsement by the University of Florida, nor does it imply registration of a pesticide under FIFRA. I thank Mr. Jim DeFilippis for assistance in field work and Drs. Rudolf Scheffrahn and Timothy Broschat for reviewing the manuscript. Seed of Honduras mahogany was supplied by the USDA Subtropical Horticultural Research Station, Miami. This is Florida Agriculture Experiment Station Journal Series No. N-00055.