The impact of the Louisiana Master Gardener Program on the perceived and actual horticultural knowledge levels of program participants

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THE IMPACT OF THE LOUISIANA MASTER GARDENER PROGRAM ON THE PERCEIVED AND ACTUAL HORTICULTURAL KNOWLEDGE LEVELS OF PROGRAM PARTICIPANTS

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

The School of Human Resource Education and Workforce Development

by

Bobby Hugh Fletcher Jr.
B.S., Southeastern Louisiana University, 1986
M.S., Louisiana State University, 1994
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LIST OF FIGURES

Figure 1. Logic model as defined by Taylor-Powell........................................26
ABSTRACT

The primary purpose of this study was to determine the impact of participation in the master gardener program on:

a. Self-perceived knowledge in selected horticultural areas;
b. Knowledge in selected areas of horticulture as measured by a researcher designed test; and
c. Use of best management practices (BMPs) in horticultural practice.

Gardening is a favorite pastime in the United States that has therapeutic and rewarding benefits. Currently, there is a great demand for accurate gardening (horticultural) information from green industry users such as gardeners from all backgrounds and areas. There is a need for research-based horticultural information to be provided to the home gardener by reputable sources.

In 1972, the “Master Gardener” concept was initiated in Washington State due to the high demand to answer consumer horticultural questions. The main objective of this program is to increase horticultural knowledge of program participants so they, in turn can transfer this research-based information to consumer horticultural clientele. The program quickly spread throughout the United States. It reached Louisiana in 1994 and was expanded throughout most metropolitan areas by 1997. No formal evaluation has ever been conducted to determine the horticultural knowledge impacts of this program.

All 257 2004 Louisiana Master Gardener program participants were surveyed both before and after participation in this program to determine programmatic impacts. The survey used was a researcher-developed instrument designed to measure self-perceived knowledge, tested knowledge, and Best Management Practices (BMPs) used.
Data were collected by currently employed master gardener coordinators and submitted to the researcher after each phase of data collection (pre and post).

Results of the study revealed that the LMG participants were highly educated, mostly Caucasian, and mostly female. Significant improvements were identified in all of the knowledge and practice measurements included in the study. These included self-perceived knowledge, tested knowledge, and use of BMPs.

It was concluded that the 2004 Louisiana Master Gardener program was effective in increasing the self-perceived horticultural knowledge and tested horticultural knowledge of program participants. In addition, the study concluded that the 2004 Louisiana Master Gardener program improved the use of BMPs among the participants.
CHAPTER ONE

INTRODUCTION

Justification and Rationale

Green Industry

Environmental horticulture (often referred to as the “green industry”) is one of the fastest growing segments of the United States agricultural economy and is made up of the following areas: the nursery and greenhouse sector, landscape design, the construction and maintenance sector, and the retail sales of horticultural goods sectors. All of these areas are related to the booming consumer horticultural industry in the United States.

According to Hall, Hodges, and Haydu (2005), the final consumers of green industry products are referred to as the end users of these products. A significant amount of the lawn, landscape and gardening services are performed by the end users themselves and home gardeners and homeowners are the major portion of these end users.

Therapeutic Value

There is a significant therapeutic value in gardening for the end users. According to Larson, Hanchek, and Vollmar (2005), Therapeutic Horticulture is the purposeful use of plants and plant-related activities to promote health and wellness for an individual or group. Gardening can benefit individuals on many levels. Reduction of stress is one area that gardening can impact an individual’s health in a positive manner.

Sources of Information

Consumer home gardeners utilize numerous sources to secure information relating to consumer horticulture such as selection of appropriate plants, installation, maintenance and care of plants as well as pest problem identification and control. The
major sources of information for home gardeners are: professional consultants, horticultural retail outlets, books and internet resources, other gardeners such as friends and neighbors, and the Cooperative Extension Service (CES).

The Cooperative Extension Service (CES) is a major resource for consumer horticultural information with offices located in most counties (parishes) in every state. Research-based information is provided in the form of publications, workshops, and various media outlets to the consumer horticultural client. This information is unbiased and research-based which can be used to assist this user group in identifying and solving problems related to consumer horticulture (Fletcher, personal communication, December 15, 2005).

Mission of Cooperative Extension

The basic mission of the CES is to bring research-based information designed to improve the quality of life of participants to all citizens, regardless of their location. The continued success of CES is dependent on each partner performing assigned tasks in an efficient manner. The USDA and land grant university research-based information is disseminated through CES providing the critical link to the end user of this product (Seevers, Graham, Gamon, & Conklin, 1997). Cooperative Extension Service has adapted to changing times and needs, and it continues to address a wide range of human, animal and plant needs in both urban and rural areas. An example of how CES has changed to meet the demands of an ever-changing society is the increased focus directed toward the increasing demand of consumer horticultural needs.
Master Gardener History

Due to the decreased professional faculty available, an alternative method to meet this consumer horticultural demand is a concept of using trained volunteers to address these consumer horticultural needs. This concept which began in Washington State in the early 70s is known as the master gardener program. Volunteers are trained by CES faculty members for 40-60 hours using research-based consumer horticultural information. These trained volunteers are encouraged to give back their volunteer time through assisting the professional faculty in answering consumer horticultural phone calls as well as expanding the horticultural outreach component of CES. An example of how volunteers implement this program is through conducting consumer horticultural educational programming for adult and youth populations, as needed. In addition, these volunteers have the opportunity to increase their leadership and communication skills through participation in an association made up of their peers.

The main objective of master gardener programs is to increase the participant’s consumer horticultural knowledge levels in areas such as soils, plant nutrition, plant pathology, weed science, entomology, vegetable gardening, fruit culture, woody plants, annual and perennials, lawn management, pesticide safety, environmental horticulture and problem solving (Koske, 2000). Once these volunteers’ knowledge levels have been increased, it is hoped that these program participants will share this horticultural research-based information with CES clientele to help them solve consumer horticultural following research-based BMPs.

Master gardener volunteers are expected to set an example within their communities by adopting these cultural or best management practices (BMPs). In
addition, the master gardener program is designed to increase community programs related to horticulture, support the 4-H youth development program, and to have a positive impact on increasing environmental awareness of the volunteers and the clientele with whom they interact with (Koske, 2000).

Program Evaluation

It is critical for CES faculty members to have an effective evaluation system in place to determine the effectiveness of the master gardener program. Local, state and federal decision-makers, clientele, and legislators are demanding higher levels of accountability for continued funding of CES programming throughout the United States. To stay ahead of this increased accountability, CES needs heightened evaluation of educational programming to justify, maintain and possibly increase local, state and federal funding.

Cooperative Extension Service faculty members currently evaluate educational programming on a daily basis through informal methods such as individual observations, farm and home visits and phone calls received. More rigorous formal evaluation methods of CES programming are needed to meet the scrutiny of decision and policy makers in today’s ever-tightening budgetary realm of society.

Determining programmatic impacts (outcomes) is the goal of formal evaluation in CES educational programming. This higher level of evaluating a program is based on informal methods stated previously but also includes more detailed and systematic methods of collecting and analyzing data. The Logic Model of evaluation (Taylor-Powell, Steele, & Douglah, 1996) calls for three levels of outcome evaluation called learning, action, and impacts. The Logic Model has three components which are inputs,
outputs, and outcomes. Inputs are classified as resources such as faculty, money, and materials while outputs are classified as the actual activities such as the program and the participants attending the training. Outcomes are classified as three levels of short term, moderate term and long term changes in behavior. Examples of short term outcomes are changes in knowledge, attitudes and skills. Moderate term examples are changes in participant’s behaviors, practices or policies while long term program impacts are civic, social and environmental changes. Effective measuring of behavioral changes in human subjects is challenging for social scientists but must be done to assure the continued funding of these educational programs.

**Problem Statement**

Master Gardener programs throughout the United States have been in place since the early 1970s but few research studies have been conducted to determine the effectiveness of these programs in accomplishing the previously stated objectives. There is no nationwide instrument currently available for program coordinators to utilize in evaluating the effectiveness of the master gardener program. The legislative audit from the State of Louisiana (2004) stated that the LSU AgCenter needed to implement more pre- and post-test assessments of its educational programs.

**Purpose of the Study**

The primary purpose of this study was to determine the impact of participation in the master gardener program on the following:

a. Self-perceived knowledge in selected areas of horticultural knowledge;

b. Knowledge in selected content areas of horticulture as measured by a researcher-designed knowledge test; and
c. Self-reported use of best management practices in selected areas of horticulture.

**Specific Objectives**

The specific objectives of this study were:

1. To describe participants of the 2004 Louisiana Master Gardener program on the following demographic characteristics:
   a. Highest level of education completed
   b. Age
   c. Gender
   d. Ethnicity
   e. Louisiana Cooperative Extension Service administrative region

2. To determine the self-perceived knowledge level of the participants prior to their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals, and the mission and role of the LSU AgCenter.

3. To determine the self-perceived knowledge level of the participants after their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals and the mission and role of the LSU AgCenter.

4. To identify the Best Management Practices reported by participants prior to participation in the 2004 Louisiana Master Gardener program.
5. To determine the Best Management Practices being implemented by participants after participation in the 2004 Louisiana Master Gardener program.

6. To determine the knowledge level of the participants as measured by a researcher-designed achievement test prior to participation in the 2004 Louisiana Master Gardener program.

7. To determine the knowledge level of the participants as measured by a researcher-designed achievement test after participation in the 2004 Louisiana Master Gardener program.

8. To determine the impact of participation in the 2004 Louisiana Master Gardener program on the following measures:
   a. Self perceived knowledge
   b. Tested knowledge
   c. Best Management Practices reported
CHAPTER TWO

REVIEW OF RELATED LITERATURE

History of Cooperative Extension Service

The Cooperative Extension Service (CES) developed due to the need to improve a rural agricultural society and to educate the lay person. The first location of an organized agricultural society relating to agricultural education in the United States was in 1785 in Philadelphia. The two major functions of this organization and others that followed were to promote agriculture and to educate the general public relating to problems facing agriculture (Sanders et al., 1966). Five years later, the United States Department of Agriculture (USDA) was created to continue this mission. Justin Morrill from the state of Vermont sponsored a bill (Morrill act) that passed as an act of the federal government in 1862 establishing the Land-Grant University system. The major purpose of this act was education and improving the agricultural and mechanical arts (Wessel & Wessel, 1982). In addition, this act created at least one college in each state designated to teach agriculture and mechanical arts. The second Morrill Act in 1890 created land grant universities designed to teach black students in agriculture and mechanical arts.

The research aspect of the land-grant system was established in 1887 with the passage of the Hatch Act that created an experiment station at each of these agricultural and mechanical colleges. Their charge was to conduct research that supported the agricultural instruction at the college. This act had close ties to research and extension and may have been the beginning of the CES and agricultural education (Hillison, 1996).

The Hatch Act states “That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment
respecting the principles and applications of agricultural science....” (Hatch Act, 1887, p. 440).

The Cooperative Extension Service (CES) was not widely used and accepted for many years after the formulation of the land-grant system in 1862. Seaman A. Knapp is considered by many to be the father of the CES (Sanders et al., 1966). He was educated in New York as a teacher and taught in Vermont until he moved to Iowa to farm and later teach agriculture as a professor at Iowa State College. He then moved to Lake Charles, Louisiana to begin selling land in the southwest corner of Louisiana to farmers from the Mid-West. This was the beginning of the concept he developed using demonstration farms to educate farmers about improving cultural practices. This concept was implemented on a larger scale and was developed through the CES (Sanders et al., 1966).

Southwest Louisiana and Texas were the sites for five demonstration farms to demonstrate improved cultural practices that would help solve problems specific to each region. This is the first documented case of knowledge transfer from the land grant university system to the local level. Knapp also worked with youth audiences and he formed the first boys’ corn club in 1909 in Louisiana (Sanders et al., 1966) and this is thought of as the beginning of the 4-H club program in Louisiana.

The CES was officially established by federal legislative passage of the Smith-Lever Act of 1914 (Sanders et al., 1966). State extension organizations were established, provided with federal funding, and conducted agricultural extension work with the support from the United States Department of Agriculture (USDA). In addition, the act stated that this work would be mutually agreed upon between the state agricultural colleges and the secretary of agriculture. For the past 90 years the Smith-Lever Act has
evolved into an effective collaboration of federal, state and local governments (Seevers et al., 1997).

The basic mission of CES is to bring the research based-information designed to improve the quality of life of all citizens, regardless of their location. The continued success of CES is dependent on each partner performing its assigned tasks in an efficient manner. The USDA and land grant university research-based information is disseminated through the CES providing the critical link to the end user of this product (Seevers et al., 1997). Furthermore, the CES is charged with improving the lives of citizens by serving as the vital link between research and the people so the need to continually evolve is critical.

Rural America has declined in size and economic importance since 1914 but the national CES remains an important player for the citizens of the United States. The Cooperative Extension Service has adapted over the years to changing times. This evolvement needs to continue to maintain the effectiveness to address a wide range of needs in both urban and rural areas. The focus of CES today is in six programmatic areas (CSREES online publication, 2006):

- **4-H Youth Development**- develop life skills in youth that build character and assist them in making appropriate life and career choices to become productive members of society through hands-on curriculum-based learning. At-risk youth participate in school retention and enrichment programs (CSREES online publication, 2006).

- **Leadership Development**- enhance and train volunteers to deliver programs in all programmatic areas and serve in leadership roles in the community (CSREES online publication, 2006).
• **Natural Resources**- teach commercial producers and consumers how to better use natural resources wisely. This includes protecting the environment through educational programs in water quality, forest management, composting, lawn waste management, and other consumer horticultural areas (CSREES online publication, 2006).

• **Family and Consumer Sciences**- teach family enhancement and development through educational programs in the areas of managing finances, proper nutrition, food safety, better child care, interpersonal relations, and health care (CSREES online publication, 2006).

• **Community and Economic Development**- support local governments through research to increase or improve economic and community development, such as improving job rate and retention, local business development, solid waste issues, tourism development, workforce education, and expansion of property utilization (CSREES online publication, 2006).

• **Agriculture**- conduct research and educational programs to help individuals learn new ways to produce income through alternative agricultural and horticultural enterprises and marketing strategies, the adoption of pest management practices, and better use of available resources.

Extension expertise delivers educational programming to meet the needs of the public at the local level regardless of the programmatic area although the number of local extension offices has declined over the years. Some local or county offices have consolidated into regional centers. Nationwide, there are 2,900 CES offices with fewer
faculty members to serve the growing needs of the diverse audience (CSREES online publication, 2006).

Cooperative Extension Service agents at the local level drive these educational programmatic areas through the involvement of clientele to help steady the direction of the CES. More and more volunteers are needed to enable CES agents to maintain their effectiveness in all programmatic areas such as agriculture, natural resources, leadership, 4-H youth development, family and consumer science, and community and economic development. Through the identification, training and development of volunteers and allowing them to be a part of the delivery mechanism of educational programming, CES has become more effective with limited resources.

**Environmental Horticulture**

Environmental horticulture (often referred to as the “green industry”) is one of the fastest growing segments of the United States agricultural economy and is made up of the following areas: the nursery and greenhouse sector, landscape design, the construction and maintenance sector, and the retail sales of horticultural goods sectors. All of these areas are related to the booming consumer horticultural industry in the United States. This economic impact has been estimated to be $148 billion (Bn) in output and responsible for nearly 2 million jobs (Hall, Hudges, & Haydu, 2005). In Louisiana, the economic impact has been estimated to be $2.2 Bn in gross sales and was responsible for 56,700 jobs (Hinson & Owings, 2005). According to a Louisiana study (Hinson, Pinel, & Hughes, 2003), gross sales on landscape and horticultural services in Louisiana in 2001 was $266.1 million. Related horticulture activities had gross sales of over $600 million in 2001. This segment of the green industry employed 9,361 individuals in 2001.
According to Hall, Hodges, & Haydu (2005), the final consumers of green industry products are referred to as the end users of these products. A significant amount of the lawn, landscape and gardening services are performed by the end users themselves and home gardeners and homeowners are the major portion of these end users. The National Gardening Association is a recognized authority on the consumer lawn and garden market and their 2004 survey indicated the following highlights relating to consumer horticulture in the United States:

- Consumers spent $38.4 Bn on lawns and gardens in 2003 and this is growing at a rate of 5 percent per year.
- Consumers spent an average of $457 per household on their lawns and gardens in 2003.
- Nearly eight out of ten (78%) of U.S. households (84 million) implemented one or more do-it-yourself lawn and garden activities in 2003.
- The most critical consumers of lawn and garden products in 2003 were men; people aged 45 or older; college graduates; households with no children at home; households in the Northeast, South, and West; married households; two-person households; and households with annual incomes over $75,000 (Hall, Hodges, & Haydu, 2005, pp. 9-10).

**Therapeutic Value**

There is a significant therapeutic value in gardening for the end users. According to Larson et al. (2005), Therapeutic Horticulture is the purposeful use of plants and plant-related activities to promote health and wellness for an individual or group. Gardening can benefit individuals on many levels. Reduction of stress is one area that gardening can impact an individual’s health in a positive manner. By diverting thoughts about yourself and your situation, the emotional benefits of gardening may be derived in part from the sense of the natural rhythm of life that plants and gardens impart. In the garden, you can create and control your environment and this aspect of control is very empowering. In
addition, gardening stimulates all of the senses, giving great pleasure and satisfaction. 
Worden, Frohne and Sullivan (2005) indicate that some of the proven benefits of horticultural therapy include: reducing physical pain, providing sensory stimulation, improving memory and concentration, easing emotional pain from bereavement or abuse, cultivating nurturing feelings, encouraging social interaction, teaching responsibility, reducing stress and anger, enhancing productivity and problem solving.

Sources of Information

Consumer home gardeners utilize numerous sources to secure information relating to consumer horticulture such as selection of appropriate plants, installation, maintenance and care of plants as well as pest problem identification and control. The major sources of information for home gardeners are: professional consultants, horticultural retail outlets, books and internet resources, other gardeners such as friends and neighbors, and the Cooperative Extension Service (CES).

Professional consultants are available and effective but not practical for a home gardener to utilize for consumer horticultural information. Retail outlets can provide consumer horticultural information to consumers but they may not have the best interest of the consumer in mind since their main priority is to sell their products. Other resources such as books and internet resources are effective depending on the educational level of the consumer. Other gardeners such as friends and neighbors may have practical knowledge based on experience but they may not be the most reliable resource for effective consumer horticultural information. Cooperative Extension Service (CES) combines all of the valued information and resources of the previously mentioned sources into one exemplary under-utilized source. Research-based information is provided in the
form of publications, workshops, and various media outlets to the consumer horticultural client. In this researcher’s experience, this information is unbiased, research-based information that can be used to assist this user group in identifying and solving problems related to consumer horticulture.

**History of the Master Gardener Program**

Since the passage of the Smith-Lever Act in 1914, the role of CES has changed somewhat due to a movement from a rural to a more urban society. As society has changed over the past 90 years, its needs have also changed and so must the CES in order to continue to be an effective, adequately funded organization. In the early 1970s, the need to answer consumer horticultural related questions became so intense, that there was a need to address this problem in Washington State (Gibby, Scheer, Collman, & Pinyuh, 2005).

Area Extension agents David Gibby and Bill Scheer were challenged to keep up with the horticultural questions as well as the demand for educational programming. The concept of training volunteers with research-based horticultural information was discussed and implemented in 1972 in Washington State. Gibby and Scheer both worked in Germany previously and they noted that proficiency in horticulture in that country was called “Gartenmeister” and they translated that to “Master Gardener” in the United States (Gibby et al., 2005). This title was implemented for those volunteers who received extensive training in horticulture and the name Master Gardener was utilized for this new educational program (Zuelow, 1989).

Master Gardener volunteers are trained with 40 to 60 hours research-based horticultural information and are required to give back volunteer time to assist the CES in
responding to consumer horticultural questions and educational programming needs (Koske, 2000). These community-based volunteers are truly interested in learning more about consumer horticulture related issues such as vegetable gardening, lawn care, annual bedding plants, perennials, ornamental shrubs, soils, botany, pesticide safety, composting, fruits and nuts, water quality as well as meeting others with like interests. A Florida study (Ruppert, Bradshaw, & Stewart, 1997) supported this concept as more than 50% of master gardeners indicated learning more about gardening was a major reason for becoming a volunteer. Two additional studies (Grieshop, 1982; Simonson & Pals, 1990) reflected similar results. In addition, these volunteers are willing to share this research-based information with others within their communities as part of their giving back aspect of the program (Koske, 2000).

Master Gardener volunteers are asked to support the youth development (4-H), agriculture and natural resources and family and consumer science components of the CES system as well as enhancing volunteer development. The Master Gardener program has expanded throughout the United States over the past 30 years.

The initial intent of the master gardener program was to serve urban audiences in Washington State but by 1991, the program was serving 92% of the counties in that state (Price, 1997). The master gardener program spread rapidly over the next 20 years from one county in Washington State to over 700 programs in 45 states and four Canadian provinces by 1991 (Price, 1997). By 1996, over 1,000 programs were in place in all 50 states as well as four Canadian provinces and it was estimated these programs had trained between 30,000 and 60,000 individuals (Price, 1997).
Four years after the master gardener program was implemented in Washington State, the program was being offered in the states of Colorado, Oregon, Montana, New York, Illinois, and Rhode Island (Master Gardener International, 1991). The Florida Cooperative Extension Service (FCES) implemented the master gardener program in 1979 due to an increase in consumer horticultural requests on the salaried staff in urban areas of the state. The program started in three counties and the program spread to 47 counties by 1996 (Ruppert et al., 1997). The rationale for this surge in gardening was due to the high inflation costs during the 1970s that forced Florida residents to cut personal budgets. This resulted in poorly trained gardeners growing their own food causing an additional strain on the salaried faculty of the FCES to answer these consumer horticultural questions (Stephens & Delate, 1984). The initial response by FCES was to train garden store employees to meet this increased need for consumer horticultural information but it was soon determined that a master gardener program needed to be implemented in the state (Ruppert et al., 1997).

Several demographic characteristics have been researched to determine the gender, education level and ethnicity of Master Gardener program participants. These studies have determined that the majority of program participants are primarily Caucasian, female and are highly educated (Rohs, Stribling, & Westerfield, 2002, Schrock, Meyer, & Snyder, 1999).

A Georgia study (Rohs, Stribling & Westerfield, 2002) found that 69% of the participants were female while a Minnesota study (Schrock, Meyer, Ascher, & Snyder, 1999) indicated that 74% were female. Another study by VanDerZanden and Kirsch (2003) found that 74% of its participants were female.
From an educational perspective, Master Gardener participants have been found to be highly educated. This is supported by a Georgia study (Roehs, Stribling, & Westerfield, 2002) that found that 80% of program participants were high school graduates, 41% had some college, 35% completed college, and 16% attained graduate degrees. Another study (Shrock, Meyer, Ascher, & Snyder, 1999) found that all participants graduated from high school, nearly 90% had some schooling beyond the high school level, 50% had college degrees, and 22% had completed post graduate work.

The ethnicity of Master Gardener program participants has been studied and has been determined to be primarily Caucasian. This is supported by a Georgia study (VanDerZanden, & Kirsch, 2003) that found 95% of program participants were Caucasian.

**History of the Louisiana Master Gardener Program**

The LSU AgCenter is interested in training, utilizing and maintaining a volunteer force to support the outreach program related to horticultural consumers. The Louisiana Master Gardener (LMG) program is a service and educational activity offered by the LSU AgCenter, Louisiana Cooperative Extension Service (LCES). The program is designed to recruit and train volunteers to help meet the educational needs of home gardeners while providing an enjoyable and worthwhile service experience for volunteers (Koske, 2000).

Well-trained volunteers are an integral part of the volunteer staff of the LSU AgCenter’s Louisiana Cooperative Extension Service (LCES). They are expected to provide unbiased, research-based educational assistance and programs on consumer horticulture issues to the gardening public (Koske, 2000). The Louisiana Master
Gardener program provides training and educational opportunities. The program is open to all people regardless of socioeconomic level, race, color, sex, religion or national origin. Master Gardener programs are all-volunteer programs sanctioned by land-grant institutions in each state and function as an extension of the college or university (Koske, 2000). In Louisiana, the program is sponsored by the LSU Agricultural Center and is directed by LCES master gardener program coordinators.

The Master Gardener program was started in Louisiana in 1994 as a means of expanding the consumer horticultural educational outreach component of the LSU AgCenter, Louisiana Cooperative Extension Service (Souvestre, 2005a). This program was adopted throughout the state in 1997 and is now offered in over 20 parishes with volunteer participation in 40 parishes. These volunteers serve in many educational roles designed to enhance the efforts of salaried faculty members through the delivery of consumer horticultural educational programs and information (Souvestre, 2005a).

In Louisiana, over 1,500 volunteers have gone through the 40-60 hours of intensive training and given back the required 40 hours of volunteer time within 12 months of graduation. The program is basically a laymen’s course in horticulture and follows a hands-on approach of teaching. The core curriculum taught throughout the state includes the following topics (Souvestre, 2005b):

- Soils and Plant Nutrition
- Basic Plant Pathology, Weed Science and Entomology
- Vegetable Gardening
- Fruit Culture
- Woody Ornamentals
- Annuals and Perennials
- Lawn Management
- Environmental Horticulture
- Problem Solving
Once the instruction aspect of the training is completed, the service phase begins with volunteers having 12 months to complete the required 40 hours of volunteer time to support the consumer horticultural outreach program of the LCES (Souvestre, 2005b). These volunteers serve in many ways such as answering consumer horticultural questions in the extension office, organizing educational programming, serving on advisory councils, conducting educational programs within the community, and serving as community horticultural leaders. A Florida study (Ruppert et al., 1988) concluded that the initial use of trained master gardener volunteers was to answer basic, horticultural questions through individual methods such as phone calls and personal visits. Established programs (that have been in place for more than five years) use volunteers for higher level projects such as writing newsletters or news articles, giving programs or demonstrations, and coordinating and participating in community gardens (Ruppert, Stevens, & Black, 1988).

According to (Souvestre, 2005a, page 1), the objectives of the Louisiana Master Gardener program include:

1. To expand the capacity of the Louisiana Cooperative Extension Service to distribute horticultural information to individuals and groups in the community.
2. To develop and enhance community programs related to horticulture. Depending on community needs, these may include environmental improvement activities, community and school garden programs and public horticultural events.
3. To enhance 4-H Youth Development programs by complementing co-curricular and extracurricular horticultural programs.
4. To develop a Louisiana Master Gardener volunteer network under the direction of the Louisiana Cooperative Extension Service.
Experienced and beginning gardeners seeking up-to-date horticultural information can advance their gardening expertise and gain self-satisfaction through volunteer efforts. A Missouri study (Ascher, Meyer, Schrock, & Snyder, 2000) found that master gardener volunteers indicated the highest ranked benefit or motivation of participating in the program was related to increasing knowledge and understanding. This is similar to the findings reported by Simonson and Pals (1990) and Finch (1997). The volunteer aspect of the LMG program allows individuals to dedicate their time and talents to enhancing the quality of life for citizens of their community by using the science and art of horticulture. It allows individuals to put into practice what they know and learn. This volunteer component has positive benefits for CES such as increasing the diversity of contacts that may have not been served by traditional methods (Laughlin & Schmidt, 1995). Feather (1990) found that these volunteers relieve Extension faculty by using their new-found knowledge to teach. This has been shown to increase volunteers self-satisfaction (Erwin, McNeely, Safrit, & Schwartz, 1996).

As limited budgets and downsizing in Extension continues to threaten program availability, expansion, and staffing, effective recruitment and increasing the knowledge levels of volunteers to maintain these programs will be increasingly important. Promoting the Master Gardener organization as a highly valued and sought after program that offers a variety of volunteer opportunities and flexible hours are personal benefits that should be emphasized during recruitment and retention efforts. The quality of the training materials and instruction by university experts from Extension are also important in increasing knowledge levels of these volunteers.
Louisiana currently does not formally evaluate the effectiveness of the Master Gardener program and the 2004 Louisiana Legislative Audit recommended that the LSU AgCenter strengthen its evaluation efforts by using or expanding the use of the following evaluation methods:

- Satisfaction surveys
- Pre- and post-tests and/or post-then pre-test surveys
- Follow-up surveys
- Direct observations
- Existing records and data
- Comparison groups
- Long-term longitudinal studies, and
- Cost-benefit analysis

Louisiana Cooperative Extension Service agents feel that LMG participants are increasing their knowledge levels related to consumer horticultural topics covered in the instructional phase of the program according to Souvestre, B.J. (personnel communication, October 1, 2003). There is no program in place to measure participants’ initial knowledge level or the level after the program is completed. In addition, BMPs being implemented prior to and after class participation need to be determined and the environmental impact of the LMG program needs to be determined. A Georgia study (Beverly, Florkowski, & Ruter, 1997) found that the overall impact of homeowners failing to follow recommended BMPs can cause environmental degradation. If these factors can be determined, it is hoped that they can be implemented across the state to bring about a more uniformly trained volunteer force to better support the consumer driven horticultural program in Louisiana. This will be the benchmark or measurement used to determine the level of knowledge gained by volunteers participating in the Louisiana Master Gardener program.
Program Evaluation

According to Weiss (1998) evaluation is a systematic assessment of the operation or outcomes of a program or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the program or policy. Other researchers (Worthen, Sanders, & Fitzpatrick, 1997) suggest that evaluation is the identification, clarification, and application of defensible criteria to determine an evaluation object’s value, quality, utility, effectiveness, or significance in relation to those criteria. According to Scriven (1991), evaluation is a process of determining the value, merit and worth of things and objective measurements are part of this process. Typical sources of data can be portfolios, surveys, written tests, performance tests, observations, ratings, focus groups, interviews, and exhibitions (Kemp, Morrison, & Ross, 1999).

Weiss suggests evaluation helps people make a wide array of instrumental action decisions such as: making midcourse corrections; continuing; expanding, or institutionalizing a program; testing a new program idea; choosing the best of several alternatives; and deciding whether or not to continue funding (Weiss, 1998).

Program evaluation in CES is critical to continued financial and programmatic support by stakeholders. Without legislative and other stakeholder input for planning, implementing and evaluating the educational programming conducted, the future of CES could be in jeopardy. Cooperative Extension Service faculty and staff are increasingly being asked for more accountability in their work by their stakeholders such as local and state legislators and clientele (Altschuld & Zheng, 1995). Programmatic impacts must be developed and based on effective evaluations of the educational programs conducted. The reasons for evaluating educational programming have changed over time and are:
assigning the merit and worth of a program, improving the organization or program, compliance and oversight, and testing theory or knowledge (Mark, Henry, & Julnes, 2000). Evaluation of educational programming can be done before, during (formative) and after (summative) a program has been implemented (Scriven, 1991). Program improvement is the goal of formative evaluation while summative evaluations are designed to insure policy compliance and determine the merit of the program.

The Louisiana Master Gardener (LMG) program follows the general guidelines on the nationwide master gardener program under the direction of the LSU AgCenter, Louisiana Cooperative Extension Service (LCES). As stated previously, the program was implemented in 1994 in Baton Rouge and adopted statewide in 1997. Since that time, no formal evaluation has been done in Louisiana to determine the impacts of the program.

Stufflebeam (2001) suggests that evaluation of programs has been around for almost 200 years. The federal government directed a large amount of taxpayer dollars into numerous human social service programs in the 1960s and many people feel this is the time when evaluation and accountability began (Stufflebeam, Madaus, & Kellaghan, 2000). According to Scriven (1991), evaluation is a new discipline but an ancient practice as early craft workers gradually improved their designs and materials over time indicating an evaluation process was utilized.

Today’s researcher has many models of evaluation to choose from. There are numerous evaluation models that have been applied with varying degrees of success to CES programs. Some models have followed a singular structured format (Bailey & Deen, 2002; Garst & Bruce, 2003), while others have used a variety of activities to demonstrate
program outcomes (Brown & Kiernan, 1998; Chapman-Novakofski et al., 2004).


It is critical for CES faculty members to have an effective evaluation system in place to determine the effectiveness of the master gardener program. Local, state and federal decision-makers, clientele, and legislators are demanding higher levels of accountability for continued funding of CES programming throughout the United States. To stay ahead of this increased accountability, CES needs heightened evaluation of educational programming to justify, maintain and possibly increase local, state and federal funding.

Cooperative Extension Service faculty members currently evaluate educational programming on a daily basis through informal methods such as individual observations, farm and home visits and phone calls received. More rigorous formal evaluation methods of CES programming are needed to meet the scrutiny of decision and policy makers in today’s ever-tightening budgetary realm of society.

Determining programmatic impacts (outcomes) is the goal of formal evaluation in CES educational programming. This is a higher level of program evaluation and is based on informal methods stated previously. In addition, it includes more detailed and systematic methods in collecting and analyzing data. The Logic Model of evaluation (Taylor-Powell, Steele & Douglah, 1996) calls for three levels of evaluation, namely
inputs, outputs and outcomes. Inputs are classified as resources such as faculty, money, and materials while outputs are classified as the actual activities such as the program and the participants attending the training. Outcomes are classified as three levels of short term, moderate term and long term changes in behavior. Examples of short term outcomes are changes in knowledge, attitudes and skills. Moderate term examples are changes in participant’s behaviors, practices or policies while long term program impacts are civic, social and environmental changes. Effective measuring of behavioral changes in human subjects is challenging for social scientists but must be done to assure the continued funding of these educational programs. The Logic Model of evaluation as defined by Taylor-Powell et al. (1996) is found in Figure 1.
Programmatic Impacts

Since the inception of the master gardener concept in 1972 in the United States, many faculty members have been hesitant about implementing this volunteer program due to the fear of taking up too much time. It does take a considerable amount of time as an investment but in the long run, this investment will yield positive results or dividends. Field faculty have estimated it takes 40% to 60% of their time to train the first class of master gardener volunteers (Ruppert, 1994). A similar study found that faculty members invest a significant amount of time in implementing and training a class of master gardener volunteers (Meyer & Hanchek, 1997).

One of the goals of the Master Gardener program is to relieve the CES faculty from answering the tremendous number of consumer horticultural calls received by county Extension offices. A California study (Grieshop & Rupley, 1984) found that the introduction of trained consumer horticulture volunteers decreased the salaried faculty time answering telephone calls by 50%. In addition, the volunteers were able to spend more than twice the amount of time answering horticultural calls from clientele. Master Gardeners also can answer repetitive horticultural questions in person (through home visits) to help relieve the Extension agent (Ruppert et al., 1988).

Cooperative Extension Service programs can further be enhanced by the training and effective utilization of Master Gardener volunteers. Master Gardener volunteers can relieve salaried faculty resources while expanding the community base of CES programming. According to Feather (1990) this allows the faculty member the opportunity to focus more on higher level teaching. Another study (Laughlin & Schmidt, 1995) supports enhancing CES delivery methods through enhancing program support,
freeing up the agent to focus on higher level programming as well as increasing the self-esteem of program participants.

There are many reasons why master gardener volunteers participate in the master gardener program such as to increase their personal knowledge related to horticulture, to interact with like-minded individuals and to give something back to the community. A study conducted in Georgia (Rohs, Stribling, & Westerfield, 2002) listed the five top personal reasons to become a master gardener as: 1) Status of belonging to the master gardener organization, 2) Flexibility to conduct the type of volunteer work they wanted, 3) Excellent quality of training materials, 4) Recognition for being a master gardener, and 5) Training provided by Extension. Additionally, increasing personal knowledge through the master gardener program was noted by over 50% of participants in Idaho and California studies (Simonson & Pals, 1990 and Grieshop, 1982). It was interesting to find that in the Idaho study (Simonson & Pals, 1990) only 6% of the participants listed they joined the master gardener program to help others.

Increasing knowledge and understanding was rated 4.35 on a five point Likert scale by Missouri Master Gardeners (Ascher et al., 2000). Master Gardeners share information garnered through their participation in the program and this has positive impacts on the program as well as the volunteers. This expanded knowledge can lead to increased self-satisfaction and sharing of this new information with others through knowledge transfer (Erwin et al., 1996).

The LMG program is not currently using any method to measure the effectiveness of the program relating to knowledge gained or adoption rate of best management practices. In Florida, over 70% of the programs use a county and staff-designed pre- and
post-test instrument to measure the changes in management practices (Ruppert et al., 1997). Research has indicated that urban gardeners use sources of information that are convenient and easy to find (Kerrigan, 1993). Knox (1997) indicated in a 1997 study that clients listed convenience as an important factor in adoption of landscape management practices. In addition, consumers are motivated to adopt these management practices when they are likely to reduce workload, add no cost, prevent environmental damage, and conform to codes within the neighborhood (Knox, 1997). These findings are supported by a Georgia study that clientele will adopt best management practices (BMPs) relating to landscape management if they are convenient and require no additional cost (Varlamoff, Florkowski, Latimer, Braman, & Jordan, 2002). This suggests that if clientele are to adopt BMPs, they must be free or inexpensive and accessible. A qualitative study conducted in Florida also supports these findings that suggest that clientele are more likely to adopt BMPs when they will reduce workload, are cost effective, prevent environmental damage and conform to neighborhood codes (Salazar, 1997).

Master Gardener seminar training is more effective than just publications given out due to the fact that salaried staff has the chance to coordinate printed materials, transfer this information in a more meaningful way as well as motivate these volunteers to be more productive (Israel, Easton, & Knox, 1998).

Summary of Review of Literature

Cooperative Extension Service has been improving the quality of life of rural and urban citizens in the United States for over 90 years by providing research-based information from land grant universities. Rural America has changed to be more urban and suburban, and programmatic efforts have changed over this period of time to reach
more non-traditional consumers. This research-based information comes primarily from the following content areas: 4-H youth development, leadership development, natural resources, family and consumer sciences, community and economic development, and agriculture.

Environmental horticulture (often referred to as the green industry) is a fast growing aspect and CES has had to change to reach a more urban and suburban audience while still working with traditional clientele. These consumer horticulturalists are implementing many do-it-yourself projects and need reliable information to insure they are utilizing recommended cultural practices in their lawns, landscapes and gardens. There is a need for research-based horticultural information to meet their increasing demand. There are many outlets or sources of information available such as consultants, retail outlets, books, and internet sources but CES is the only research-based, reliable source that can provide unbiased consumer horticultural information.

In the past 30 years, Cooperative Extension agents have been increasingly called upon to answer more and more consumer horticultural phone calls. This increasing demand in conjunction with reduced budgets has caused Extension professionals to rely more heavily on trained volunteers to assist in responding to basic horticultural questions. The “Master Gardener” concept began in Washington State in 1972 and quickly spread throughout the United States as a way to meet this increasing consumer horticultural demand (Gibby et al., 2005). Volunteers were trained with 40 to 60 hours of research-based horticultural information to assist CES agents in responding to consumer horticultural questions as well as assisting in program delivery, while supporting the 4-H
youth development program. By 1996, there were over 1,000 programs in place in all 50 states and 30,000 to 60,000 volunteers had been trained (Price, 1997).

The Master Gardener concept reached Louisiana in 1994 and was adopted statewide by 1997 and is currently in 20 parishes and has participation from 40 parishes (Souvestre, 2005a). Over 1,500 volunteers have completed the Louisiana Master Gardener program. These volunteers have been used to answer basic horticultural calls as well as provide higher levels of service such as writing newsletters, delivering educational materials through different methods using the research-based information provided by the land-grant system.

Louisiana currently does not formally evaluate the effectiveness of the Master Gardener program and the 2004 Louisiana Legislative Audit recommended that the LSU AgCenter strengthen its evaluation efforts by using or expanding the use of the following evaluation methods:

- Satisfaction surveys
- Pre- and post-tests and/or post- then pre-test surveys
- Follow-up surveys
- Direct observations
- Existing records and data
- Comparison groups
- Long-term longitudinal studies, and
- Cost-benefit analysis

Scriven (1991) suggests that evaluation is a process of determining the value, merit, or worth of things and that objective measurements are part of this process. The goal of any evaluation is to improve the program, give stakeholders an opportunity in the decision making process, and ensure the program is in compliance with appropriate policies.
Determining programmatic impacts (outcomes) is the goal of formal evaluation in CES educational programming. This is a higher level of program evaluation and is based on informal methods stated previously. In addition, it includes more detailed and systematic methods in collecting and analyzing data. The Logic Model of evaluation (Taylor-Powell, Steele & Dougla, 1996) calls for three levels of evaluation: inputs, outputs and outcomes. Effectively measuring behavioral changes in human subjects is challenging for social scientists but must be done to assure the continued funding of these educational programs.

The introduction of “Master Gardeners” in other states has decreased salaried time answering phone calls by 50% (Grieshop & Rupley, 1984). In addition, these volunteers can answer questions through home visits to help relieve salaried faculty (Ruppert et al., 1988) while giving these faculty members an opportunity to focus on higher level teaching (Feather, 1990, Laughlin & Schmidt, 1995).

There is a need to determine if the Master Gardener program in Louisiana is effective in increasing the knowledge level and adoption rate of Best Management Practices among this group of volunteers.
CHAPTER THREE

METHODOLOGY

Population and Sample

The target population for this study was defined as all individuals who participated in the instructional component of the 2004 Louisiana Master Gardener (LMG) program. The accessible population was defined as all individuals who participated in and completed the 2004 LMG program. The frame of the accessible population was established as all individuals for whom completed pre and post assessments were received by the researcher. A total of 257 individuals were included in this defined accessible population. The researcher made the decision to select a 100% sample (a census) of this defined accessible population for inclusion in the current study.

Instrumentation

The instrument used in this study was a researcher designed measuring instrument which consists of three primary sections. The first section of the instrument was designed to collect selected demographic information regarding the study subjects. The information selected was chosen based on conceptual and/or empirical expectation of a relationship between the characteristic and self-perceived and/or actual knowledge of horticultural content of the subjects. These variables included: (1) highest level of education completed; (2) age; (3) gender; and (4) ethnicity.

The second section of the instrument was designed to measure the self-perceived knowledge level of the participants regarding selected content areas in the field of horticulture. Respondents were asked to report their current knowledge in each of 12 specified areas on a five point anchored scale with values ranging from 1 = “No
knowledge” to 5 = “Most knowledge.” General and specific questions included participants perceived knowledge of core concepts taught using the Louisiana Master Gardener handbook such as botany, soils, turf (lawn care), weed identification and control, plant diseases, vegetable production, pesticide safety, fruits/nuts, entomology (insects), annual bedding plants, ornamentals (shrubs), and the mission and role of the LSU AgCenter. In addition, participants were asked to list the Best Management Practices (BMPs) they were currently using in their lawn, landscape and/or garden.

Content Validity

The content validity of this study was established through a field test of the instrument and a review by a panel of experts. The initial instrument was field tested with one LMG class from the year prior to the research group. Information received from this field test was used to refine the wording of items within the instrument which were judged to be problematic. In addition, the instrument was expanded to add the section which assesses objectively the specific content knowledge level of respondents (essentially the knowledge test). Subsequently, the refined and expanded instrument was submitted to a panel of experts with a request that they review the instrument for content validity and clarity. This panel consisted of 20 Louisiana Master Gardener program coordinators in Louisiana, the state coordinator of the LMG program, and three individuals employed by a research extensive university with specific expertise in instrument design. The final version of the instrument was developed based on input from this panel of experts.
Data Collection

To accomplish the objectives of the study, the pre- and post-survey instrument (Appendix A) was distributed to statewide Louisiana Master Gardener coordinators in all eight administrative areas of the Louisiana Cooperative Extension Service via U. S. mail in advance of their implementation of the 2004 LMG program. Dr. Paul Coreil (Director of the LCES) included a cover letter explaining the importance of the study. In addition, a letter from the researcher and the statewide Master Gardener coordinator was included explaining the steps involved in administering the pre- and post-test instrument as well as returning the completed instruments. The Master Gardener coordinators were requested to administer the pre-test on the first day of the program and post-test on the last day of the program. The time frame of the instructional phase of all programs in Louisiana ranged from eight to 20 weeks depending on how often the program was offered per week and the amount of instructional time allotted per period.

In order to obtain the maximum percentage of instrument returns, the following follow-up techniques were used:

1. A coordinator check list was mailed with each instrument packet along with the LCES Director cover letter and instructions from the statewide Master Gardener coordinator and researcher letter with instructions (see Appendix B).

2. If the pre and post tests were not returned within 14 days of completion by each coordinator, a phone call was made to the program coordinator as a friendly reminder.

3. All program coordinators were contacted by the researcher and all programs implemented in 2004 were included.
Analysis of the Data

Each objective was evaluated through the data analysis outlined below:

1. The first objective of the study was to describe participants of the 2004 Louisiana Master Gardener program on the following demographic characteristics:
   a. Highest level of education completed
   b. Age
   c. Gender
   d. Ethnicity
   e. Louisiana Cooperative Extension Service administrative region

Frequencies and percentages in categories were calculated for each characteristic.

2. The second objective of this study was to determine the self-perceived knowledge level of the participants prior to their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals and the mission and role of the LSU AgCenter.
   a. These items gave respondents the choice to rank their self-perceived knowledge on the core horticultural concepts taught prior to the LMG program on an anchored scale. Means and standard deviations were calculated for each item on the scale.

3. The third objective of this study was to determine the self-perceived knowledge level of the participants after their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production,
pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals and the mission and role of the LSU AgCenter.

a. These items gave respondents the choice to rate their self-perceived knowledge on the core horticultural concepts taught after their participation in the LMG program on an anchored scale. Means and standard deviations were calculated for each item on the scale.

4. The fourth objective of this study was to identify the Best Management Practices (BMPs) reported by participants prior to participation in the 2004 Louisiana Master Gardener program.

a. Participants listed the BMPs being implemented prior to the program being conducted. A listing and calculation of the total number of BMPs were completed for each participant.

5. The fifth objective of this study was to determine the Best Management Practices (BM’s) being implemented by participants after participation in the 2004 Louisiana Master Gardener program.

a. Participants listed the BMPs being implemented after the program was completed. A listing and calculation of the total number of BMPs were completed for each participant.

6. The sixth objective of this study was to determine the knowledge level of the participants as measured by a researcher-designed achievement test prior to participation in the 2004 Louisiana Master Gardener program.
a. The total number of correct items among the 22 knowledge items on the instrument was calculated as well as the number of participants who answered each item correctly.

7. The seventh objective of this study was to determine the knowledge level of the participants as measured by a researcher-designed achievement test after participation in the 2004 Louisiana Master Gardener program.
   a. The total number of correct items among the 22 knowledge items on the instrument was calculated as well as the number of participants who answered each item correctly.

8. The eighth objective of this study was to determine the impact of participation in the 2004 Louisiana Master Gardener program on the following measures:
   a. Self perceived knowledge
   b. Tested knowledge
   c. Best Management Practices reported

A dependent t-test procedure was used to compare the pre- and post-assessments for each measure.
CHAPTER FOUR

FINDINGS

The primary purpose of this study was to determine the impact of participation in the master gardener program on the following measures:

- Self-perceived knowledge in selected areas of horticultural knowledge;
- Knowledge in selected content areas of horticulture as measured by a researcher designed knowledge test; and
- Self-reported use of best management practices in selected areas of horticulture.

A 100% sample of the 257 individuals who participated in the 2004 Louisiana Master Gardener program was selected to participate in the study. A researcher-designed survey was utilized to gather this information and can be found in Appendix A.

This chapter describes the demographic characteristics of the subjects (educational level, age, gender, ethnicity, and administrative region of the Louisiana Cooperative Extension Service), the reported self-perceived knowledge level of participants (pre and post) on the core curriculum taught during the instructional phase of the Louisiana Master Gardener program, the Best Management Practice’s (BMPs) being used (pre and post) by program participants, and the results of a researcher-designed achievement test administered pre and post to participants.

Research Objective One

The first objective of this study was to describe participants of the 2004 Louisiana Master Gardener program on the following demographic characteristics:

- Highest level of education completed
- Age
- Gender
- Ethnicity
- Louisiana Cooperative Extension Service administrative region
a. Highest level of education completed. The participants were first described on the variable, highest level of education completed. The participants were asked to indicate their highest level of education completed by selecting the most appropriate response from the following categories: less than high school; high school graduate or GED; Technical school, business school, some college or associate degree; and college (BS/BA degree) or beyond (advanced degrees). The largest group (n = 123, 48.0%) of participants indicated that their highest level of education completed was college (BS/BA degree) or beyond (advanced degrees). The smallest group (n = 1, 0.4%) of participants indicated their highest education level as less than high school. The highest level of education completed reported by participants is presented in Table 1.

Table 1
Highest Level of Education Reported by 2004 Louisiana Master Gardener Program Participants

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than High School</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>High School or GED</td>
<td>40</td>
<td>15.6</td>
</tr>
<tr>
<td>Technical School, Business School, some College or</td>
<td>92</td>
<td>36.0</td>
</tr>
<tr>
<td>Associate Degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College degree or beyond</td>
<td>123</td>
<td>48.0</td>
</tr>
<tr>
<td>Total</td>
<td>256</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*One study participant did not respond to this item*

b. Age. The participants were described on the variable, age. The participants were asked to indicate their age by selecting the most appropriate response from the following categories: 18 to 34 years; 35 to 49 years; 50 to 64 years; 65 to 74 years; and 75 years and over. The largest group (n = 139, 54.1%) of the participants indicated their
age was between 50 and 64 years. The smallest group (n = 7, 2.7%) indicated their age was 75 years or older. The age reported by the participants is presented in Table 2.

Table 2
Age Reported by 2004 Louisiana Master Gardener Program Participants

<table>
<thead>
<tr>
<th>Age in years</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 to 34</td>
<td>12</td>
<td>4.7</td>
</tr>
<tr>
<td>35 to 49</td>
<td>70</td>
<td>27.2</td>
</tr>
<tr>
<td>50 to 64</td>
<td>139</td>
<td>54.1</td>
</tr>
<tr>
<td>65 to 74</td>
<td>29</td>
<td>11.3</td>
</tr>
<tr>
<td>75 or more</td>
<td>7</td>
<td>2.7</td>
</tr>
<tr>
<td>Total</td>
<td>257</td>
<td>100.0</td>
</tr>
</tbody>
</table>

c. Gender. The sample was also described on the variable gender. The majority (n = 205, 79.8%) were female, whereas 20.2% (n = 52) were male.

d. Ethnicity. Respondents were additionally described on the variable, ethnicity. The majority of the participants (n = 237, 92.2%) reported their ethnicity as Caucasian. Two participants (n = 2, .8%) reported their ethnicity as “Other” and one participant (n = 1, .4%) reported his/her ethnicity as Asian. The ethnicity of the participants is presented in Table 3.

Table 3
Ethnicity Reported by 2004 Louisiana Master Gardener Program Participants

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>237</td>
<td>92.2</td>
</tr>
<tr>
<td>African American</td>
<td>10</td>
<td>3.9</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4</td>
<td>1.6</td>
</tr>
<tr>
<td>American Indian</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>Other*</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Total</td>
<td>257</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*The participants who checked “other” did not specify their ethnicity.

e. Louisiana Cooperative Extension Administrative Region. Respondents were also described on the variable, Louisiana Cooperative Extension Administrative Region. A legend listing the Louisiana Cooperative Extension Administrative Regions can be found.
in Appendix B. Participants were categorized into these regions based on the Parish they listed on the survey. The region identified by the parish reported by the largest number of participants was the Southeast \((n = 70, 27.2\%)\) followed closely by the Crescent \((n = 59, 23.0\%)\). The region with the fewest reported respondents was the Central region \((n = 13, 5.1\%)\), and there were no respondents from the North Central region. Louisiana Cooperative Extension Administrative Region of participants is presented in Table 4.

<table>
<thead>
<tr>
<th>Louisiana Cooperative Extension Service Administrative Region</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southeast</td>
<td>70</td>
<td>27.2</td>
</tr>
<tr>
<td>Crescent</td>
<td>59</td>
<td>23.0</td>
</tr>
<tr>
<td>South Central</td>
<td>34</td>
<td>13.2</td>
</tr>
<tr>
<td>Northwest</td>
<td>33</td>
<td>12.8</td>
</tr>
<tr>
<td>Southwest</td>
<td>30</td>
<td>11.7</td>
</tr>
<tr>
<td>Northeast</td>
<td>18</td>
<td>7.0</td>
</tr>
<tr>
<td>Central</td>
<td>13</td>
<td>5.1</td>
</tr>
<tr>
<td>North Central</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>257</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Research Objective Two

The second objective of this study was to determine the self-perceived knowledge level of the participants prior to their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals, and the mission and role of the LSU AgCenter.

Responses to the researcher-designed self-perceived knowledge section were measured on a five point anchored scale with values as follows: 1 = “No Knowledge;” 2
= “Some Knowledge;” 3 = “Moderate Knowledge;” 4 = “A Lot of Knowledge;” and 5 = “Most Knowledge.” Means and standard deviations for each item and an overall mean were calculated to summarize the data for this objective. Respondents were asked to provide a rating on each instructional core curriculum component of the Louisiana Master Gardener program (botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals and the mission and role of the LSU AgCenter).

To facilitate the interpretation of the results for this objective, the researcher established the following interpretive scale: 1 – 1.49 = “No knowledge;” 1.50 – 2.49 = “Some Knowledge;” 2.50 – 3.49 = “Moderate Knowledge;” 3.50 – 4.49 = “A Lot of Knowledge;” and 4.50 – 5.0 = “Most Knowledge.” Based on the results of this analysis, the area in which participants of the 2004 Louisiana Master Gardener program perceived that they had the highest level of knowledge prior to participating in the program was “Annual Bedding Plants” (Mean = 2.63, SD = .844). Using the researcher established interpretive scale, their knowledge in this area was rated as “Moderate Knowledge.” The area in which the group had the lowest level of self-perceived knowledge prior to participating in the program was “Fruits and Nuts” (Mean = 1.74, SD = .717). Their knowledge in this area was classified in the “Some Knowledge” category. Overall, prior to participating in the Master Gardener Program, the participants rated their knowledge in 11 of the 12 areas in the “Some knowledge” category and one area in the “Moderate Knowledge” category. The mean of each item is presented in Table 4.

In addition to examining the individual items included in the scale, the researcher computed an overall self-perceived knowledge score for the respondents prior to their
participation in the Master Gardener Program. This score was defined as the mean of the rating assigned to the 11 horticulture content area items. The item, “Mission of the LSU AgCenter” was not included in the overall self-perceived knowledge score since it does not relate directly to their horticultural knowledge. When this score was calculated, the mean of the 252 participants who rated the items was 2.05 (SD = .551) with overall scores ranging from 1.00 (the lowest possible score) to 4.10. This overall score was classified using the researcher established interpretive scale as “Some Knowledge.”

Table 5
Pre-Test Mean Scores of 2004 Participants on Self-Perceived Knowledge of Core Louisiana Master Gardener Horticultural Curriculum

<table>
<thead>
<tr>
<th>Scale Item</th>
<th>Mean&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SD</th>
<th>Number rating Item</th>
<th>Knowledge Rating&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Bedding Plants</td>
<td>2.63</td>
<td>.844</td>
<td>251</td>
<td>Moderate</td>
</tr>
<tr>
<td>Ornamentals</td>
<td>2.43</td>
<td>.860</td>
<td>252</td>
<td>Some</td>
</tr>
<tr>
<td>Mission and Role of LSU AgCenter</td>
<td>2.35</td>
<td>.894</td>
<td>249</td>
<td>Some</td>
</tr>
<tr>
<td>Vegetable production</td>
<td>2.18</td>
<td>.882</td>
<td>250</td>
<td>Some</td>
</tr>
<tr>
<td>Pesticide Safety</td>
<td>2.12</td>
<td>.934</td>
<td>252</td>
<td>Some</td>
</tr>
<tr>
<td>Soils</td>
<td>1.95</td>
<td>.775</td>
<td>250</td>
<td>Some</td>
</tr>
<tr>
<td>Turf</td>
<td>1.92</td>
<td>.756</td>
<td>250</td>
<td>Some</td>
</tr>
<tr>
<td>Weed Identification</td>
<td>1.92</td>
<td>.704</td>
<td>248</td>
<td>Some</td>
</tr>
<tr>
<td>Botany</td>
<td>1.91</td>
<td>.779</td>
<td>245</td>
<td>Some</td>
</tr>
<tr>
<td>Entomology</td>
<td>1.89</td>
<td>.743</td>
<td>244</td>
<td>Some</td>
</tr>
<tr>
<td>Plant Diseases</td>
<td>1.85</td>
<td>.660</td>
<td>243</td>
<td>Some</td>
</tr>
<tr>
<td>Fruits and Nuts</td>
<td>1.74</td>
<td>.717</td>
<td>250</td>
<td>Some</td>
</tr>
<tr>
<td>Overall Score&lt;sup&gt;c&lt;/sup&gt;</td>
<td>2.05</td>
<td>.551</td>
<td>252</td>
<td>Some</td>
</tr>
</tbody>
</table>

<sup>a</sup>Response Scale: 1 = No Knowledge; 2 = Some Knowledge; 3 = Moderate Knowledge; 4 = A lot of Knowledge; 5 = Most Knowledge

<sup>b</sup>Interpretive Scale: 1 – 1.45 = No Knowledge; 1.50 – 2.49 = Some Knowledge; 2.50 – 3.49 = Moderate Knowledge; 3.50 – 4.49 = A Lot of Knowledge; 4.50 – 5.0 = Most Knowledge

<sup>c</sup>Overall Score: Mean of the individual items excluding “Mission and role of the LSU AgCenter”
Research Objective Three

The third objective of this study was to determine the self-perceived knowledge level of the participants after their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals and the mission and role of the LSU AgCenter.

Responses to the researcher-designed self-perceived knowledge section were measured on a five point anchored scale with values as follows: 1 = “No Knowledge;” 2 = “Some Knowledge;” 3 = “Moderate Knowledge;” 4 = “A Lot of Knowledge;” and 5 = “Most Knowledge.” Means and standard deviations for each item and an overall mean were calculated to summarize the data for this objective. Respondents were asked to provide a rating on each instructional core curriculum component of the Louisiana Master Gardener program (botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals and the mission and role of the LSU AgCenter). To facilitate the interpretation of the results for this objective, the researcher established the following interpretive scale: 1 – 1.49 = “No knowledge;” 1.50 – 2.49 = “Some Knowledge;” 2.50 – 3.49 = “Moderate Knowledge;” 3.50 – 4.49 = “A Lot of Knowledge;” and 4.50 – 5.0 = “Most Knowledge.”

When participants of the 2004 Louisiana Master Gardener program rated their self-perceived knowledge after participation in the program, the area which was assigned the highest rating was “Mission of the LSU AgCenter” (Mean = 3.60, SD = .946). Using
the researcher established interpretive scale the rating on this area was classified as “A Lot of Knowledge.” The area which received the second highest rating was “Annual Bedding Plants” with a rating of 3.35 (SD = .893). This item was classified as “Moderate Knowledge” using the interpretive scale. Furthermore, the Botany area received the lowest rating (Mean = 2.64, SD = .712) by program participants yielding an interpretive scale classification of “Moderate Knowledge.” Overall, one of the areas was rated as “A Lot of Knowledge” and the remaining 11 items were rated in the “Moderate Knowledge” category. The mean of each item is presented in Table 6.

In addition to examining the individual items included in the scale, the researcher computed an overall self-perceived knowledge score for the respondents after their participation in the Master Gardener Program. This score was defined as the mean of the rating assigned to the 11 horticulture content area items. The item, “Mission of the LSU AgCenter” was not included in the overall self-perceived knowledge score. When this score was calculated, the mean of the 213 participants who provided complete information was 2.92 (SD = .609) with overall scores ranging from 1.27 to 4.45. This overall score was classified using the researcher established interpretive scale as “Moderate Knowledge.”

**Table 6**

<table>
<thead>
<tr>
<th>Scale Item</th>
<th>Mean</th>
<th>SD</th>
<th>Number rating Item</th>
<th>Knowledge Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission of LSU AgCenter</td>
<td>3.60</td>
<td>.946</td>
<td>209</td>
<td>A Lot</td>
</tr>
<tr>
<td>Annual Bedding Plants</td>
<td>3.35</td>
<td>.893</td>
<td>212</td>
<td>Moderate</td>
</tr>
<tr>
<td>Ornamentals</td>
<td>3.24</td>
<td>.850</td>
<td>213</td>
<td>Moderate</td>
</tr>
<tr>
<td>Pesticide Safety</td>
<td>3.15</td>
<td>.882</td>
<td>210</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

*(table continued)*
Research Objective Four

The fourth objective of this study was to identify the Best Management Practices reported by participants prior to participation in the 2004 Louisiana Master Gardener program.

Study participants were asked to respond to the following open-ended item, “List all Best Management Practices (BMPs) you are using in your lawn, landscape or garden.” To accomplish this objective, the researcher summarized the data in the following ways: First, all of the BMPs identified by the respondents classified into six principal practice areas were compiled into a list. A seventh category included in this listing was BMPs which were identified by the respondents that were errors. In other words, the respondent listed a practice as a BMPs which is not recognized as a Best Management Practice by the Cooperative Extension Service. This data was then summarized by the calculation of three BMPs scores for each participant. These three scores were: the total number of BMPs identified, the total number of BMPs errors identified, and the total number of accurate BMPs identified.

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>Category Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td>3.00</td>
<td>.888</td>
<td>213</td>
<td>Moderate</td>
</tr>
<tr>
<td>Turf</td>
<td>2.95</td>
<td>.757</td>
<td>211</td>
<td>Moderate</td>
</tr>
<tr>
<td>Soils</td>
<td>2.90</td>
<td>.755</td>
<td>213</td>
<td>Moderate</td>
</tr>
<tr>
<td>Plant Diseases</td>
<td>2.75</td>
<td>.739</td>
<td>207</td>
<td>Moderate</td>
</tr>
<tr>
<td>Weeds</td>
<td>2.73</td>
<td>.794</td>
<td>213</td>
<td>Moderate</td>
</tr>
<tr>
<td>Fruits and Nuts</td>
<td>2.71</td>
<td>.773</td>
<td>211</td>
<td>Moderate</td>
</tr>
<tr>
<td>Entomology</td>
<td>2.71</td>
<td>.746</td>
<td>207</td>
<td>Moderate</td>
</tr>
<tr>
<td>Botany</td>
<td>2.64</td>
<td>.712</td>
<td>211</td>
<td>Moderate</td>
</tr>
<tr>
<td>Overall Score</td>
<td>2.92</td>
<td>.609</td>
<td>213</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

*Response Scale: 1 = No Knowledge; 2 = Some Knowledge; 3 = Moderate Knowledge; 4 = A lot of Knowledge; 5 = Most Knowledge

*Interpretive Scale: 1 – 1.45 = No Knowledge; 1.50 – 2.49 = Some Knowledge; 2.50 – 3.49 = Moderate Knowledge; 3.50 – 4.49 = A Lot of Knowledge; 4.50 – 5.0 = Most Knowledge

*Overall Score: Mean of the individual items excluding “Mission and role of the LSU AgCenter”
Israel (1999, et al) identified six areas known as landscape management practices and these areas were utilized in this study to categorize BMPs listed by program participants. These six areas are:

- Site analysis, planting, and landscape design,
- Irrigation practices,
- Fertilization,
- Pest management,
- Mowing and pruning, and
- Mulching.

The researcher added weeding and composting to the sixth category as these BMPs are related to the BMPSS “mulching.” In addition, the BMPs listed by participants in error is also included. A complete listing of BMPs reported prior to participation in the 2004 Louisiana Master Gardener program by respondents by these seven categories can be found in Appendix D.

Of the 257 Louisiana Master Gardener program participants, 160 provided responses to this question at the pre-test data collection. These 160 respondents identified a total of 518 Best Management Practices at the pre-test with 81 BMPs reported in error. Each of the BMPs identified by the respondents was examined to determine if it was an accurate BMP with the Florida Study by Israel (1999) used as the basis for determining accuracy. As with the completion items on the tested knowledge section for the instrument, if a BMP was incomplete or questionable as to its accuracy, it was classified by the researcher as an error BMP. Therefore, the total number of accurate Best Management Practices reported by program participants was 437. The total number of BMPs reported by category at the pre-test measurement are listed as follows: Site analysis, planting, and landscape design (68), Irrigation practices (68), Fertilization (71),
Pest management (62), Mowing and pruning (40), Mulching (125), and Error (85). It should be noted here that these numbers are the total BMPs identified not unique BMPs.

Examination of the summary data for the Best Management Practices (BMPs) reported at the pre-test by respondents revealed that the number of BMPs reported by the 160 participants that responded to this question ranged from one to eight with a mean total number of BMPs of 3.24 (SD = 1.64). However, of the 3.24 Best Management Practices identified by participants, a mean of .51 (SD = .84) of them were identified in error ranging from zero to five. This yielded an Accurate Best Management Practice mean score for responding 2004 Louisiana Master Gardner participants prior to participation in the program of 2.73 (SD = 1.62, Range = 0 to 7). The means of the total number of Best Management Practices reported, as well as the error and accurate BMPs at the pre-test are presented in Table 7.

Table 7
Total, Error, and Accurate Numbers of Best Management Practices listed by Respondents at the Pre-Test Measurement

<table>
<thead>
<tr>
<th>Best Management Practice (BMPSS)</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total BMPs</td>
<td>160</td>
<td>3.24</td>
<td>1.64</td>
<td>1.0 to 8.0</td>
</tr>
<tr>
<td>Error BMPs</td>
<td>160</td>
<td>.51</td>
<td>.84</td>
<td>0.0 to 5.0</td>
</tr>
<tr>
<td>Accurate BMPs</td>
<td>160</td>
<td>2.73</td>
<td>1.62</td>
<td>0.0 to 7.0</td>
</tr>
</tbody>
</table>

Research Objective Five

The fifth objective of this study was to determine the Best Management Practices being implemented by participants after participation in the 2004 Louisiana Master Gardener program.
Study participants were asked to respond to the following open-ended item, “List all Best Management Practices (BMPs) you are using in your lawn, landscape or garden.” To accomplish this objective, the researcher summarized the data in the following ways: First, all of the BMPs identified by the respondents classified into six principal practice areas were compiled into a list. A seventh category included in this listing was BMPs which were identified by the respondents that were errors. In other words, the respondent listed a practice as a BMPs which is not recognized as a Best Management Practice by the Cooperative Extension Service. This data was then summarized by the calculation of three BMPs scores for each participant. These three scores were: the Total number of BMPs identified, the total number of BMPs errors identified, and the total number of accurate BMPs identified.

Israel (1999, et al) identified six areas known as landscape management practices and these areas were utilized in this study to categorize BMPs listed by program participants. These six areas are:

- Site analysis, planting, and landscape design,
- Irrigation practices,
- Fertilization,
- Pest management,
- Mowing and pruning, and
- Mulching.

The researcher added weeding and composting to the sixth category as these BMPs are related to the BMPs “mulching.” In addition, the BMPs listed by participants in error is also included. A complete listing of BMPs reported after participation in the 2004 Louisiana Master Gardener program by respondents by these seven categories can be found in Appendix D.
Of the 257 Louisiana Master Gardener program participants, 177 provided responses to this question at the post-test data collection. These 177 respondents identified a total of 779 Best Management Practices at the post-test with 27 reported in error. Therefore, the total number of accurate Best Management Practices reported by program participants was 752. The total number of BMPs reported by category at the post-test measurement are listed as follows: Site analysis, planting, and landscape design (152), Irrigation practices (96), Fertilization (83), Pest management (130), Mowing and pruning (88), Mulching (202), and Error (27). It should be noted here that these numbers are the total BMPs identified not unique BMPs.

Examination of the summary data for the Best Management Practices (BMPs) reported at the post-test by respondents revealed that the number of BMPs reported by the 177 participants that responded to this question ranged from zero to twelve with a mean total number of BMPs of 4.40 (SD = 2.16). However, of the 4.40 Best Management Practices identified by participants, a mean of .15 (SD = .41) of them were identified in error (ranging from zero to two). This yielded an Accurate Best Management Practice mean score for responding 2004 Louisiana Master Gardener participants after to participation in the program of 4.25 (SD = 2.16, Range = 0 to 12). The means of the total number of Best Management Practices reported, as well as the error and accurate at the pre-test are presented in Table 8.

Table 8
Total, Error, and Accurate Number of Best Management Practices listed by Respondents at the Post-Test Measurement

<table>
<thead>
<tr>
<th>Best Management Practice (BMPs)</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total BMPs</td>
<td>177</td>
<td>4.40</td>
<td>2.16</td>
<td>0.0 to 12.0</td>
</tr>
<tr>
<td>Error BMPs</td>
<td>177</td>
<td>.15</td>
<td>.41</td>
<td>0.0 to 2.0</td>
</tr>
<tr>
<td>Accurate BMPs</td>
<td>177</td>
<td>4.25</td>
<td>2.16</td>
<td>0.0 to 12.0</td>
</tr>
</tbody>
</table>
Research Objective Six

The sixth objective of this study was to determine the knowledge level of the participants as measured by a researcher-designed achievement test prior to participation in the 2004 Louisiana Master Gardener program.

On the first day of the Louisiana Master Gardener program, participants were asked to respond to 22 questions as part of the instrument. These questions consisted of closed ended, true or false, and listing questions. These questions were directly related to the core curriculum areas to be covered during the Louisiana Master Gardener instructional phase of the program. Each of the 22 items was rated as correct or incorrect and no partial credit was given. An example of this is question six on the instrument:

The insect’s body is composed of three parts, please name them:

1.
2.
3.

Participants were required to list all three correctly to receive credit for this type of question.

The overall mean number of items answered correctly as measured by the researcher designed achievement test prior to participation in the 2004 Louisiana Master Gardener program was 13.33 (n = 253, SD = 3.32) or 60.58% (13.33/22) correct. This overall score was defined as the number of correct answers divided by the number of questions included on the instrument (22) and then converted to a percentage score to give a percentage correct response.

The question receiving the greatest number of correct answers (n = 251, 99.2% ) prior to participation in the 2004 Louisiana Master Gardener program was question
number 8 (Poorly drained soils account for many plant problems, true or false). The question receiving the second greatest number of correct answers (n = 241, 95.3%) prior to participation in the 2004 Louisiana Master Gardener program was question number 3 (This type of plant completes its entire life cycle, from seed to germination to seed production, in one growing season. a. Annual, b. Biennial, c. Perennial). The question which received the fewest number of correct answers (n = 55, 21.7%) was question number 6 (The insect’s body is composed of three parts, name them) followed closely by question number 13 (Weeds can be spread by the following means: a. b. c…..) with the second fewest correct answers (n = 57, 22.5%). Number of correct responses to each item are presented in Table 9.

Table 9
Accuracy of Responses to Tested Knowledge on Horticultural Items Among 2004 Louisiana Master Gardener Program Participants Prior to Participation in the Program

<table>
<thead>
<tr>
<th>Question</th>
<th>n Correct</th>
<th>n Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Poorly drained soils account for many plant problems.</td>
<td>251</td>
<td>2</td>
<td>253</td>
</tr>
<tr>
<td></td>
<td>99.2%</td>
<td>0.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>3. This type of plant completes its life cycle from seed germination to seed production in one growing season.</td>
<td>241</td>
<td>12</td>
<td>253</td>
</tr>
<tr>
<td></td>
<td>95.3%</td>
<td>4.7%</td>
<td>100.0%</td>
</tr>
<tr>
<td>7. Insects help to produce fruits, seeds, vegetables and flowers by……………..the blossoms.</td>
<td>229</td>
<td>24</td>
<td>253</td>
</tr>
<tr>
<td></td>
<td>90.5%</td>
<td>9.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td>24. What is the best flowering winter annual for landscape beds?</td>
<td>223</td>
<td>30</td>
<td>253</td>
</tr>
<tr>
<td></td>
<td>88.1%</td>
<td>11.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

(table continued)
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Options</th>
<th>Correct Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. Placing a layer of organic or inorganic material on top of the soil to prevent weeds is called ……………...</td>
<td>210 83.0%      43 17.0%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>10. These microscopic, filamentous plants that lack chlorophyll and derive much of their energy from living organisms or non-living organic matter.</td>
<td>203 80.2%      50 19.8%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>9. The leaf’s most important function is to ………………</td>
<td>201 79.4%      52 20.6%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>18. A measurement which expresses the degree of acidity or alkalinity of soil or growth media is called ……</td>
<td>198 78.3%      55 21.7%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>5. The most common symptom of drought stress in plants is …………………</td>
<td>191 75.5%      62 24.5%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>15. This provides the physical anchor for the plant to stand upright ………...</td>
<td>186 73.5%      67 26.5%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>23. Vegetables can be successfully grown …………</td>
<td>176 69.6%      77 30.4%</td>
<td>253 100.9%</td>
</tr>
<tr>
<td>14. Perhaps the single most important cultural practice associated with lawn maintenance is ……….</td>
<td>145 57.3%      108 42.7%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>16. A 7.6 pH is an example of an acidic soil.</td>
<td>127 50.2%      126 49.8%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>21. Most diseases need free standing water and warmth for active growth ……...</td>
<td>117 46.2%      136 53.8%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>19. The ………… printed on or attached to the container of pesticide tells how to use the product correctly and what specific safety measures need to be taken.</td>
<td>115 45.5%      136 53.8%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>4. List three principal functions of roots</td>
<td>112 44.3%      141 55.7%</td>
<td>253 100.0%</td>
</tr>
<tr>
<td>12. A weed is simply defined as ……………………</td>
<td>98 38.7%       155 61.3%</td>
<td>253 100.0%</td>
</tr>
</tbody>
</table>

(table continued)
11. The middle number (10) on a bag of fertilizer with an analysis of 6-10-4 represents which nutrient? | 94 | 159 | 253 | 37.2 | 62.8% | 100.0%
---|---|---|---|---|---|---
20. How many times should an empty pesticide container be rinsed prior to being disposed of? | 81 | 172 | 253 | 32.0% | 68.0% | 100.0%
---|---|---|---|---|---|---
22. Which grass requires the most maintenance for best performance? | 62 | 191 | 253 | 24.5% | 75.5% | 100.0%
---|---|---|---|---|---|---
13. Weeds can be spread in the following means | 57 | 196 | 253 | 22.5% | 77.5% | 100.0%
---|---|---|---|---|---|---
6. The insect’s body is composed of three parts, please name them | 55 | 198 | 253 | 21.7% | 78.3% | 100.0%
---|---|---|---|---|---|---

**Research Objective Seven**

The seventh objective of this study was to determine the knowledge level of the participants as measured by a researcher designed achievement test after participation in the 2004 Louisiana Master Gardener program.

On the last day of the Louisiana Master Gardener program, participants were asked to respond to 22 questions as part of the instrument. These questions consisted of closed ended, true or false, and listing questions. These questions were directly related to the core curriculum areas to be covered during the Louisiana Master Gardener instructional phase of the program. Each of the 22 items was rated as correct or incorrect and no partial credit was given. An example of this is question six on the instrument:

The insects body is composed of three parts, please name them:

1. 
2. 
3. 

---
Participants were required to list all three correctly to receive credit for this type of question.

The overall mean number of items answered correctly as measured by a researcher designed achievement test after participation in the 2004 Louisiana Master Gardener program was 17.89 (n = 216, SD = 2.37) or 81.31% (17.89/22) correct. This overall score was defined as the number of correct answers divided by the number of questions included on the instrument (22) and then converted to a percentage score to give a percentage correct response.

The questions receiving the greatest number of correct answers (n = 213, 98.6%) after participation in the 2004 Louisiana Master Gardener program were question number 3 (This type of plant completes its entire life cycle, from seed to germination to seed production, in one growing season. a. Annual, b. Biennial, c. Perennial) and number 8 (Poorly drained soils account for many plant problems, true or false). The question receiving the next greatest number of correct answers (n = 210, 97.2%) after participation in the 2004 Louisiana Master Gardener program was question number 17 (Placing a layer of organic or inorganic material on top of the soil to prevent weeds is called…….).

Question 22 (Which grass requires the most maintenance for best performance? a. St. Augustine b. Centipede c. Zoysia d. Carpet) received the fewest number of correct answers (n = 107, 49.5%) followed by question number 13 (Weeds can be spread by the following means: a. b. c. ) with the second fewest correct answers (n = 113, 52.3%).

Number of correct responses to each item are presented in Table 10.
Table 10
Accuracy of Responses to Tested Knowledge Horticultural Items Among 2004 Louisiana Master Gardener Program Participants After Participation in the Program

<table>
<thead>
<tr>
<th>Question</th>
<th>Correct</th>
<th>Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. This type of plant completes its life cycle from seed germination to seed production in one growing season.</td>
<td>213</td>
<td>3</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>98.6%</td>
<td>1.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>8. Poorly drained soils account for many plant problems.</td>
<td>213</td>
<td>3</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>98.6%</td>
<td>1.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>17. Placing a layer of organic or inorganic material on top of the soil to prevent weeds is called ……………..</td>
<td>210</td>
<td>6</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>97.2%</td>
<td>2.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>7. Insects help to produce fruits, seeds, vegetables and flowers by……………..the blossoms.</td>
<td>207</td>
<td>9</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>95.8%</td>
<td>4.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>18. A measurement which expresses the degree of acidity or alkalinity of soil or growth media is called ……</td>
<td>207</td>
<td>9</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>95.8%</td>
<td>4.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>5. The most common symptom of drought stress in plants is …………………..</td>
<td>206</td>
<td>10</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>95.4%</td>
<td>4.6%</td>
<td>100.0%</td>
</tr>
<tr>
<td>9. The leaf’s most important function is to ………………</td>
<td>205</td>
<td>11</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>94.9%</td>
<td>5.1%</td>
<td>100.0%</td>
</tr>
<tr>
<td>24. What is the best flowering winter annual for landscape beds?</td>
<td>201</td>
<td>15</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>93.1%</td>
<td>6.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>19. The ……….. printed on or attached to the container of pesticide tells how to use the product correctly and what specific safety measures need to be taken.</td>
<td>184</td>
<td>32</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>85.2%</td>
<td>14.8%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

(table continued)
10. These microscopic, filamentous plants that lack chlorophyll and derive much of their energy from living organisms or non-living organic matter.

<table>
<thead>
<tr>
<th></th>
<th>181</th>
<th>35</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>83.8%</td>
<td>16.2%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

16. A 7.6 pH is an example of an acidic soil.

<table>
<thead>
<tr>
<th></th>
<th>181</th>
<th>35</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>83.8%</td>
<td>16.2%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

11. The middle number (10) on a bag of fertilizer with an analysis of 6-10-4 represents which nutrient?

<table>
<thead>
<tr>
<th></th>
<th>176</th>
<th>40</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>81.5%</td>
<td>18.5%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

12. A weed is simply defined as …………………

<table>
<thead>
<tr>
<th></th>
<th>176</th>
<th>40</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>81.5%</td>
<td>18.5%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

20. How many times should an empty pesticide container be rinsed prior to being disposed of?

<table>
<thead>
<tr>
<th></th>
<th>175</th>
<th>41</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>81.0%</td>
<td>19.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

15. This provides the physical anchor for the plant to stand upright…………

<table>
<thead>
<tr>
<th></th>
<th>173</th>
<th>43</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80.1%</td>
<td>19.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

23. Vegetables can be successfully grown ………

<table>
<thead>
<tr>
<th></th>
<th>173</th>
<th>43</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80.1%</td>
<td>19.9%</td>
<td>100.9%</td>
</tr>
</tbody>
</table>

14. Perhaps the single most important cultural practice associated with lawn maintenance is ……………

<table>
<thead>
<tr>
<th></th>
<th>172</th>
<th>44</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>79.6%</td>
<td>20.4%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

6. The insect’s body is composed of three parts, please name them ………

<table>
<thead>
<tr>
<th></th>
<th>150</th>
<th>66</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>69.4%</td>
<td>30.6%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

4. List three principle functions of roots

<table>
<thead>
<tr>
<th></th>
<th>121</th>
<th>95</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>56.0%</td>
<td>44.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

21. Most diseases need free standing water and warmth for active growth…………

<table>
<thead>
<tr>
<th></th>
<th>120</th>
<th>96</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>55.6%</td>
<td>44.4%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

13. Weeds can be spread in the following means………

<table>
<thead>
<tr>
<th></th>
<th>113</th>
<th>103</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>52.3%</td>
<td>47.7%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

22. Which grass requires the most maintenance for best performance?

<table>
<thead>
<tr>
<th></th>
<th>107</th>
<th>109</th>
<th>216</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>49.5%</td>
<td>50.5%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Research Objective Eight

The eighth objective of this study was to determine the impact of participation in the 2004 Louisiana Master Gardener program on the following measures:

- a. Self perceived knowledge
- b. Tested knowledge
- c. Best Management Practices reported

a. Self-Perceived Knowledge. In order to measure the impact of the Louisiana Master Gardener program on the self-perceived knowledge of participants, the overall self-perceived knowledge score of the participants prior to participation in the program was statistically compared with the overall self-perceived knowledge score of the participants after participation in the program. These overall self-perceived knowledge scores were defined as the mean of the self ratings in 11 horticultural content areas which were measured as both pre-test and post-test measures. The comparison was made using the dependent t-test procedure. A total of 208 complete measurements (including complete responses to all items on both pre and post-tests) were available for analysis. The mean overall self-perceived knowledge pre-test score was 2.06 (SD = .565), and the mean overall self-perceived knowledge post-test score was 2.93 (SD = .605). The difference between these two measures was .87, and when the scores were compared statistically, the difference was found to be significant ($t_{207} = 19.248$, $p < .001$).

b. Tested Knowledge. In order to measure the impact of the Louisiana Master Gardener program on the tested knowledge of the participants, the overall tested knowledge score of participants prior to participation in the program was statistically compared to the overall tested knowledge score of participants after participation in the program. These overall tested knowledge scores were defined as the mean of the
percentage of correctly answered items on a researcher-designed achievement test with 22 horticultural-related questions which were measured as both pre-test and post-test measures. The comparison was made using the dependent t-test procedure. A total of 212 complete measurements (including complete responses to all items on both pre and post-tests) were available for analysis. The overall mean knowledge pre-test score was 60.01% (SD = 3.34), and the mean overall tested knowledge post-test score was 81.35% (SD = 2.38). When the difference between these two measures was compared statistically, this difference was found to be significant ($t_{211} = 22.57$, $p < .001$).

c. Best Management Practices Reported. In order to measure the difference between the BMPs reported by respondents at the pre-test and post-test, the researcher divided the responses into three categories: Total BMPs reported, BMPs reported in error, and Accurate BMPs reported.

In order to measure the impact of the Louisiana Master Gardener program on the total number of BMPs reported by program participants, the overall total number of BMPs reported prior to participation in the program was statistically compared with the overall total number of BMPs reported after participation in the program. These overall total numbers of BMPs reported were defined as the means of the overall number of BMPs measured as both pre and post-test measures. The comparison was made using the dependent t-test procedure. A total of 118 complete measurements (including complete responses to all items on the pre and post-tests) were available for analysis. The mean overall total number of BMPs reported by program participants at the pre-test was 3.34 (SD = 1.74), and the mean overall total number of BMPs reported by program participants at the post-test was 4.85 (SD = 2.26). The difference between these two
measures was 1.51, and when the scores were compared statistically, the difference was found to be significant ($t_{117} = 7.191, p < .001$) indicating a significant increase in the total number of BMPs identified.

In order to measure the impact of the Louisiana Master Gardener program on the total number of BMPs reported in error by program participants, the overall total number of BMPs reported in error prior to participation in the program was statistically compared with the overall total number of BMPs reported in error after participation in the program. These overall total numbers of BMPs reported in error were defined as the means of the overall number of BMPs in error measured as both pre and post-test measures. The comparison was made using the dependent t-test procedure. A total of 118 complete measurements (including complete responses to all items on the pre and post-tests) were available for analysis. The mean overall total number of BMPs reported in error by program participants at the pre-test was 0.57 (SD = 0.91), and the mean overall total number of BMPs reported in error by program participants at the post-test was 0.14 (SD = 0.40). The difference between these two measures was 0.43, and when the scores were compared statistically, the difference was found to be significant ($t_{117} = 5.113, p < .001$) indicating a significant decrease in the total number of BMPs identified incorrectly.

In order to measure the impact of the Louisiana Master Gardener program on the total number of accurate BMPs reported by program participants, the overall total number of accurate BMPs reported prior to participation in the program was statistically compared with the overall total number of accurate BMPs reported after participation in the program. These overall total numbers of accurate BMPs reported were defined as the means of the overall number of accurate BMPs measured as both pre and post-test
measures. The comparison was made using the dependent t-test procedure. A total of 118 complete measurements (including complete responses to all items on the pre and post-tests) were available for analysis. The mean overall total number of accurate BMPs reported by program participants at the pre-test was 2.77 (SD = 1.69), and the mean overall total number of accurate BMPs reported by program participants at the post-test was 4.70 (SD = 2.26). The difference between these two measures was 1.93, and when the scores were compared statistically, the difference was found to be significant (t_{117} = 9.903, p < .001) indicating a significant increase in the total number of accurate BMPs identified.
CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The primary purpose of this study was to determine the impact of participation in the master gardener program on the following measures:

a. Self-perceived knowledge in selected areas of horticultural knowledge;
b. Knowledge in selected content areas of horticulture as measured by a researcher designed knowledge test; and
c. Reported use of best management practices in selected areas of horticulture.

Specific Objectives

The specific objectives of this study were:

1. To describe participants of the 2004 Louisiana Master Gardener program on the following demographic characteristics:
   a. Highest level of education completed
   b. Age
   c. Gender
   d. Ethnicity
   e. Louisiana Cooperative Extension Service administrative region

2. To determine the self-perceived knowledge level of the participants prior to their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals and the mission and role of the LSU AgCenter.

3. To determine the self-perceived knowledge level of the participants after their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects,
annual bedding plants, ornamentals and the mission and role of the LSU AgCenter.

4. To identify the Best Management Practices reported by participants prior to participation in the 2004 Louisiana Master Gardener program.

5. To determine the Best Management Practices being implemented by participants after participation in the 2004 Louisiana Master Gardener program.

6. To determine the knowledge level of the participants as measured by a researcher designed achievement test prior to participation in the 2004 Louisiana Master Gardener program.

7. To determine the knowledge level of the participants as measured by a researcher designed achievement test after participation in the 2004 Louisiana Master Gardener program.

8. To determine the impact of participation in the 2004 Louisiana Master Gardener program on the following measures:
   a. Self perceived knowledge
   b. Tested knowledge
   c. Best Management Practices reported

To accomplish the objectives of the study, the pre and post survey instruments were distributed to statewide Louisiana Master Gardener coordinators in all five administrative areas of the Louisiana Cooperative Extension Service via U. S. mail in advance of their implementation of the 2004 LMG program. Dr. Paul Coreil (Director of the LCES and Vice Chancellor of the LSU AgCenter) supported this study by providing a cover letter explaining the importance of this study. In addition, a letter from the researcher and statewide Master Gardener coordinator was included and explained the
steps involved in administering the pre and post test instruments as well as returning the completed instruments. Pre-tests were administered on the first day of the program and post-tests were administered on the last day of the program by program coordinators. The length of period between all programs in Louisiana ranged from eight to 20 weeks depending on the program coordinator, whether the program met once or twice per week and the length of each instructional period.

In order to obtain the maximum instrument returns, the following follow-up techniques were used:

1. A coordinator check list was mailed with each instrument packet along with the LCES Director cover letter and instructions from the statewide Master Gardener coordinator and researcher letter with instructions (see Appendix B).
2. If the pre and post tests were not returned within 14 days of completion by each coordinator, a phone call was made to the program coordinator as a friendly reminder.
3. All program coordinators were contacted by the researcher and all programs implementing programs in 2004 were included.

**Summary of Major Findings**

The first objective of this study was to describe participants of the 2004 Louisiana Master Gardener program on the following demographic characteristics: Highest level of education completed, Age, Gender, Ethnicity, and Louisiana Cooperative Extension Service administrative region.

The majority of the respondents of the 2004 Louisiana Master Gardener program reported their highest level of education completed as higher than a high school diploma or GED with 36% (n = 92) reporting Technical school, Business school, some college or Associate degree and 48% (n = 123) reporting college degree or beyond. In regards to age, the majority (54.1%) of participants selected their age in the range of 50 to 64 (n = 139). The majority of participants (n = 205, 78.9%) were female and the ethnicity of a
majority of participants was Caucasian (n = 237, 92.2%). A majority (n = 129, 50.2%) of the participants were from two administrative regions (Southeast and Crescent) of the Louisiana Cooperative Extension Service while there were no participants from the North Central region.

The second objective of this study was to determine the self-perceived knowledge level of the participants prior to their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals and the mission and role of the LSU AgCenter.

To facilitate the interpretation of the results for this objective, the researcher established the following interpretive scale: 1 – 1.49 = “No knowledge;” 1.50 – 2.49 = “Some Knowledge;” 2.50 – 3.49 = “Moderate Knowledge;” 3.50 – 4.49 = “A Lot of Knowledge;” and 4.50 – 5.0 = “Most Knowledge.” Based on the results of this analysis, the area in which participants of the 2004 Louisiana Master Gardener program perceived that they had the highest level of knowledge prior to participating in the program was “Annual Bedding Plants” (Mean = 2.63, SD = .844). Using the researcher established interpretive scale, their knowledge in this area was rated as “Moderate Knowledge.” The area in which the group had the lowest level of self-perceived knowledge prior to participating in the program was “Fruits and Nuts” (Mean = 1.74, SD = .717). Their knowledge in this area was classified in the “Some Knowledge” category. Overall, prior to participating in the Master Gardener Program, the participants rated their knowledge in
11 of the 12 areas in the “Some knowledge” category and one area in the “Moderate Knowledge” category.

In addition to examining the individual items included in the scale, the researcher computed an overall self-perceived knowledge score for the respondents prior to their participation in the Master Gardener Program. This score was defined as the mean of the rating assigned to the 11 horticulture content area items. The item, “Mission of the LSU AgCenter” was not included in the overall self-perceived knowledge score. When this score was calculated, the mean of the 252 participants who provided complete information was 2.05 (SD = .551) with overall scores ranging from 1.00 (the lowest possible score) to 4.10. This overall score was classified using the researcher established interpretive scale as “Some Knowledge.”

The third objective of this study was to determine the self-perceived knowledge level of the participants after their participation in the 2004 Louisiana Master Gardener program on the following areas relating to horticulture: botany, soils, turf, weed identification and control, plant diseases, vegetable production, pesticide safety, fruits and nuts, insects, annual bedding plants, ornamentals and the mission and role of the LSU AgCenter. To facilitate the interpretation of the results for this objective, the researcher established the following interpretive scale: 1 – 1.49 = “No knowledge;” 1.50 – 2.49 = “Some Knowledge;” 2.50 – 3.49 = “Moderate Knowledge;” 3.50 – 4.49 = “A Lot of Knowledge;” and 4.50 – 5.0 = “Most Knowledge.”

Participants of the 2004 Louisiana Master Gardener program rated only one section with a “A Lot of Knowledge” rating. The Mission of the LSU AgCenter section was rated the highest (Mean = 3.60, SD = .946). All other items being rated by program
participants were classified in the “Moderate Knowledge” category. The section receiving the lowest self-perceived knowledge rating was Botany (Mean = 2.64, SD = .712) which was classified as “Moderate Knowledge.”

In addition to examining the individual items included in the scale, the researcher computed an overall self-perceived knowledge score for the respondents after their participation in the Master Gardener Program. This score was defined as the mean of the rating assigned to the 11 horticulture content area items. The item, “Mission of the LSU AgCenter” was not included in the overall self-perceived knowledge score. When this score was calculated, the mean of the 213 participants who provided complete information was 2.92 (SD = .609) with overall scores ranging from 1.27 to 4.45. This overall score was classified using the researcher established interpretive scale as “Moderate Knowledge.”

The fourth objective of this study was to identify the Best Management Practices reported by participants prior to completion of the 2004 Louisiana Master Gardener program.

The information provided by participants regarding the BMPSS use was summarized in multiple ways. First, the researcher provided a verbatim list of all BMPs reported by the respondents which was summarized to include the total number of BMPs and the total number of BMPs in each of the six recognized practice areas as well as the total number of error BMPs. This list is included in Appendix D. Additionally, the researcher computer three BMPs scores for each of the 160 participants who responded to this item. These scores included the total number of BMPs listed, the number of BMPs
listed that were identified as incorrect (errors), and the number of accurate BMPs listed by the respondents.

The total number of accurate Best Management Practices reported by 2004 Louisiana Master Gardener program participants at the pre-test measurement was 437. Program participants initially reported a total number of 518 BMPs at the pre-test but 81 of these were reported but later determined by the researcher to not actually be recognized by the Cooperative Extension Service as BMPs. The total number of BMPs reported by category at the pre-test measurement are listed as follows: Site analysis, planting, and landscape design (68), Irrigation practices (68), Fertilization (71), Pest management (62), Mowing and pruning (40), Mulching (125), and Error (85).

The total number of Best Management Practices reported by the 160 participants who responded to this item at the pre-test ranged from one to eight (n = 160, Mean = 3.24, SD = 1.64). Best Management Practices errors being reported at the pre-test by respondents ranged from zero to five (n = 160, Mean = .51, SD = .84). Accurate Best Management Practices reported at the pre-test by respondents ranged from zero to seven (n = 160, Mean = 2.73, SD = 1.62).

The fifth objective of this study was to determine the Best Management Practices being implemented by participants after completion of the 2004 Louisiana Master Gardener program.

The information provided by participants regarding the BMP use was summarized in multiple ways. In this case, they were summarized similarly to the pre-test measures reported in Objective four.
The total number of accurate Best Management Practices reported by 2004 Louisiana Master Gardener program participants was 779. Program participants initially reported a total number of 806 BMPs at the pre-test but 27 of these were reported but later determined by the researcher to not actually be recognized by the Cooperative Extension Service as BMPs. The total number of BMPs reported by category at the post-test measurement are listed as follows: Site analysis, planting, and landscape design (153), Irrigation practices (96), Fertilization (83), Pest management (130), Mowing and pruning (88), Mulching (202), and Error (27).

The total number of Best Management Practices reported at the post-test by respondents ranged from zero to twelve (n = 177, Mean = 4.40, SD = 2.16). Best Management Practices errors being reported at the post-test by respondents ranged from zero to two (n = 177, Mean number of errors being reported = .15, SD = .41). Actual Best Management Practices reported at the post-test by respondents ranged from zero to twelve (n = 177, Mean = 4.25, SD = 2.16).

The sixth objective of this study was to determine the knowledge level of the participants as measured by a researcher designed achievement test prior to participation in the 2004 Louisiana Master Gardener program.

The question receiving the greatest number of correct answers (n = 251, 99.2%) prior to participation in the 2004 Louisiana Master Gardener program was question number 8 (Poorly drained soils account for many plant problems, true or false). The question receiving the second greatest number of correct answers (n = 241, 95.3%) prior to participation in the 2004 Louisiana Master Gardener program was question number three (This type of plant completes its entire life cycle, from seed to germination to seed
production, in one growing season. a. Annual, b. Biennial, c. Perennial). The question which received the fewest number of correct answers (n = 55, 21.7%) was question number six (The insects body is composed of three parts, name them) followed closely by question number 13 (Weeds can be spread by the following means: a. b. c…..) with the second fewest correct answers (n = 57, 22.5%). The overall mean score on the 22 item researcher designed achievement test prior to participation in the 2004 Louisiana Master Gardener program was 13.33 (n = 253, SD = 3.32) or 60.58% (13.33/22) correct.

The seventh objective of this study was to determine the knowledge level of the participants as measured by a researcher designed achievement test after participation in the 2004 Louisiana Master Gardener program.

The questions receiving the greatest number of correct answers (n = 213, 98.6% ) after participation in the 2004 Louisiana Master Gardener program were questions number 3 (This type of plant completes its entire life cycle, from seed germination to seed production, in one growing season. a. Annual b. Biennial c. Perennial) and number 8 ( Poorly drained soils account for many plant problems: True or False). The question receiving the next greatest number of correct answers (n = 210, 97.2%) after participation in the 2004 Louisiana Master Gardener program was question number 17 (Placing a layer of organic or inorganic material on top of the soil to prevent weeds is called……..).

Question 22 (Which grass requires the most maintenance for best performance? a. St. Augustine b. Centipede c. Zoysia d. Carpet) received the fewest number of correct answers (n = 107, 49.5%) followed by question number 13 (Weeds can be spread by the following means: a. b. c. ) with the second fewest correct answers (n = 113, 52.3%). The overall mean score on the 22 item researcher designed achievement test after
participation in the 2004 Louisiana Master Gardener program was 17.89 (n = 216, SD = 2.37) or 81.31% (17.89/22) correct.

The eighth objective of this study was to determine the impact of participation in the 2004 Louisiana Master Gardener program on the following measures:

a. Self perceived knowledge
b. Tested knowledge
c. Best Management Practices reported

The mean overall self-perceived knowledge pre-test score was 2.06 (SD = .565), and the mean overall self-perceived knowledge post-test score was 2.93 (SD = .605). The difference between these two measures was .87, and when the scores were compared statistically, the difference was found to be significant ($t_{207} = 19.248$, $p < .001$).

The mean tested knowledge pre-test score was 60.58% (SD = 3.34), and the mean overall tested knowledge post-test score was 81.31% (SD = 2.38). When the difference between these two measures were compared statistically, the difference was found to be significant ($t_{211} = 22.57$, $p < .001$), such that the post-test score was higher.

The mean overall total number of BMPs reported by program participants at the pre-test was 3.34 (SD = 1.74), and the mean overall total number of BMPs reported by program participants at the post-test was 4.85 (SD = 2.26). The difference between these two measures was 1.51, and when the scores were compared statistically, the difference was found to be significant ($t_{117} = 7.191$, $p < .001$), such that the post-test score was higher.

The mean number of BMPs reported in error by program participants at the pre-test was 0.57 (SD = 0.91), and the mean number of BMPs reported in error by program participants at the post-test was 0.14 (SD = 0.40). The difference between these two
measures was 0.43, and when the scores were compared statistically, the difference was found to be significant ($t_{117} = 5.113, p < .001$), such that the post-test score was lower.

The mean number of accurate BMPs reported by program participants at the pre-test was 2.77 (SD = 1.69), and the mean number of accurate BMPs reported by program participants at the post-test was 4.70 (SD = 2.26). The difference between these two measures was 1.93, and when the scores were compared statistically, the difference was found to be significant ($t_{117} = 9.903, p < .001$), such that the post-test score was higher.

**Conclusions and Recommendations**

The following conclusions and recommendations were derived from the findings of the study:

1. Participants in the Louisiana Master Gardener program are highly educated.

   This conclusion is based on the finding that the majority of the respondents of the 2004 Louisiana Master Gardener program reported their highest level of education completed as higher than a high school diploma or GED with 36% reporting Technical school, Business school, some college or Associate degree and 48% reporting college degree or beyond while only 16% reported having a high school diploma, GED or less.

   These findings are similar to findings by a Georgia study (Rohs, Stribling, & Westerfield, 2002) that found 80% of program participants were high school graduates, 41% had some college, 35% completed college, and 16% attained graduate degrees.

   Another study (Shrock, Meyer, & Snyder, 1999) found that all participants graduated from high school, nearly 90% had some schooling beyond the high school level, 50% had college degrees, and 22% had completed post graduate work.
An implication of this conclusion is that the CES can place considerable confidence in the capabilities of this group of individuals. Most of them have demonstrated their ability to learn by completion of advanced educational programs. Additionally, they have demonstrated their interest in both the content of horticulture and in offering their efforts as volunteers for the CES. Therefore, the implication is that CES can place a significant amount of confidence in this highly educated group of volunteers as they have demonstrated their ability to learn through their participation in the program. With the appropriate volunteer support, the consumer horticultural outreach program of CES can be expanded greatly, thus continuing to meet the ever increasing need for research-based information. This can greatly help the limited faculty assigned to this content knowledge area to be more effective in responding to their clientele base.

2. The majority of participants of the Louisiana Master Gardener program are from urban and suburban areas of Southeastern Louisiana.

   This conclusion is based on the findings that the majority of the respondents (n = 129) of the 2004 Louisiana Master Gardener program were from the Southeast (27.2%) and Crescent (23.0%) regions located in the southeast Louisiana along the I-10/I-12 corridor near New Orleans and Baton Rouge. In addition, only 5.1% of the total participation came from the North Central and Central regions of the state.

   The researcher recommends that further research needs to be conducted by the CES to determine the needs within these rural areas of the state. The researcher has identified the following methods that could be implemented:

   - Measure the consumer horticultural call volume in rural parishes to determine if there is a need for the Louisiana Master Gardener program
   - Implement a survey through the Horticultural Hints newsletter to determine interest in the Louisiana Master Gardener program
- Identify the staffing patterns in these rural parishes to determine if there is a need to implement the Louisiana Master Gardener program to support limited faculty
- Utilize the Advisory Leadership Council process to determine if these areas could benefit from a regional Louisiana Master Gardener program to cover several rural parishes

Based on these findings and conclusions the researcher recommends that the Cooperative Extension Service increase efforts to expand the Master Gardener program, especially in the North Central and Central regions where limited participation has been garnered. In addition, research should be done to find out why Master Gardener programs are currently not being implemented in regions that have shown limited participation. Also, the Cooperative Extension Service needs to conduct additional research to determine what the interest is throughout the entire population for the Master Gardener program. If the results from these studies show that there is a need to implement this program in these regions of the state, additional efforts need to be exerted by CES to expand the Master Gardener program into these areas.

3. Participants in the 2004 Louisiana Master Gardener program improved their knowledge of and use of Best Management Practices

This conclusion is based on the findings that the mean overall total number of BMPs reported by program participants at the pre-test was 3.34 (SD = 1.74), and the mean overall total number of BMPs reported by program participants at the post-test was 4.85 (SD = 2.26). The difference between these two measures was 1.51, and when the scores were compared statistically, the difference was found to be significant (t_{117} = 7.191, p < .001). In addition the pre-test was 2.77 (SD = 1.69), and the mean overall total number of accurate BMPs reported by program participants at the post-test was 4.70 (SD = 2.26). The difference between these two measures was 1.93, and when the scores were
compared statistically, the difference was found to be significant ($t_{117} = 9.903, p < .001$). Finally, the mean overall total number of BMPs reported in error by program participants at the pre-test was 0.57 ($SD = 0.91$), and the mean overall total number of BMPs reported in error by program participants at the post-test was 0.14 ($SD = 0.40$). The difference between these two measures was 0.43, and when the scores were compared statistically, the difference was found to be significant ($t_{117} = 5.113, p < .001$).

The significant increase in the implementation of Best Management Practices by participants indicates that they have initiated a change in behavior after participation in the Louisiana Master Gardener program. By actually putting these recommended BMPs into action, they set the example for others in their community to follow.

The researcher recommends that further research be conducted to determine the environmental and economic impacts related to the adoption of Best Management Practices by program participants. In addition, research needs to be conducted to determine the long term adoption rate of these BMPs by program participants. If the 2004 LMG program motivated participants to adopt more BMPs, they should continue to improve and adopt even more. Runoff from urban landscapes is a major issue throughout the United States, especially in coastal states such as Louisiana. The long term adoption and implementation of research-based BMPs by program participants; could decrease these forms of non-point source pollution and have positive environmental and economic impacts on the community. The researcher recommends a follow up study one year after the program ended to determine if these learners continued to learn and adopt BMPs. Additional training could be provided for these volunteers to take their service to a higher
level such as implementing BMPs training for residential homeowners with the hope of reducing non point source pollution on a larger scale.

4. A majority of participants in the Louisiana Master Gardener program reported their ethnicity as Caucasian.

This conclusion is based on the findings that a majority of the respondents (n = 237, 92.2%) of the 2004 Louisiana Master Gardener program were Caucasian. Based on the experience of the researcher, Cooperative Extension Service programs reach a traditional Caucasian audience and have not been widely accepted by minority populations.

These findings are similar to findings from a Georgia study (VanDerZanden, & Kirsch, 2003) that found 95% of program participants to be Caucasian. The researcher recommends that the Cooperative Extension Service conduct research to find out why more minorities are not participating in the Master Gardener program. Examples of research that could be conducted are:

- Conduct interviews with minorities in communities to determine why they do not participate in CES Master Gardener programming
- Conduct interviews with minorities that are participating in CES Master Gardener programming to determine why they are participating and if these programs are meeting their needs

5. The Louisiana Master Gardener program is effective in increasing horticultural knowledge of program participants.

This conclusion is based on the findings that program participants made statistically significant increases on both self-perceived and tested horticultural knowledge after participation in the Louisiana Master Gardener program. The self perceived knowledge increase is based on the findings that mean self-perceived ratings in
the 11 horticultural content knowledge scores increased from 2.06 (n = 252, SD = .565) at the pre-test measurement indicating “some knowledge” to 2.93 (n = 213, SD = .605) at the post-test measurement indicating “moderate knowledge.” The difference between these two measures was .87 and when compared statistically, was found to be significant ($t_{207} = 19.248$, $p < .001$). The tested horticultural knowledge increase is based on the findings that the overall mean knowledge pre-test score was 60.01% (SD = 3.34), and the mean overall tested post-test score was 81.35% (SD = 2.38). The difference between these two measures was compared statistically and the difference was found to be significant ($t_{211} = 22.57$, $p < .001$).

It is important to note that participants who have a higher level of self-perceived knowledge at the end of the program are more likely to share this knowledge with others than those with lower self-perceived knowledge levels or scores, thus increasing the likelihood that they will fulfill the initial volunteer component of the program.

Positive and significant changes in the self-perceived knowledge scores coupled with positive and significant changes in the tested knowledge scores in this study are critical to this group of volunteers to have the ability to share research-based consumer horticultural information with the target audience of horticultural consumers. It is important to point out that those with a lower self-perceived horticultural knowledge score may not be willing to share the information, even though their tested knowledge scores may be high. In addition, a volunteer with a high self-perceived knowledge score and a low tested knowledge score could potentially cause problems with inappropriate recommendations being made to consumer horticultural clientele.
The researcher further recommends that Cooperative Extension Service undertake research to determine if there is a need or desire for an advanced Master Gardener instructional program to be developed and implemented. With the continued decline in faculty members assigned for consumer horticultural needs, this cadre of volunteers can receive additional, more in-depth research-based training to be better utilized in program delivery of the Master Gardener or Junior Master Gardener program. In addition, there is a need to educate homeowners in relation to non-point source pollution caused by not following recommended BMPs.

These highly trained volunteers could be used to implement this type of “master homeowner” training, thus helping to reduce runoff from Louisiana landscapes into critical waterways and possibly reducing coastal erosion. These enhanced roles could possibly increase retention through more meaningful volunteer tasks that better utilize the expertise and experience of advanced, better trained Master Gardeners who have received additional, more in-depth training. This study has determined that this group of Louisiana Master Gardener program participants is highly educated and increased their self-perceived and tested horticultural knowledge levels. Cooperative Extension Service faculty should take this highly educated, motivated group of volunteers to better meet the needs of consumer horticultural clientele.

The researcher recommends for Cooperative Extension Service to undertake research to determine the optimum number of hours of instructional time to maximize achievement scores in the Louisiana Master Gardener program. Instructional time ranged from 40 to 60 hours for the 2004 Louisiana Master Gardener program and increased
achievement scores could be reached if an optimum number of instructional hours could be determined and replicated throughout the state.

Based on these findings and conclusions the researcher recommends that the Cooperative Extension Service initiate a regular evaluation system to determine or measure the effectiveness of this program on an on going basis. The instrument used in this study would be one possible measuring device to use for this purpose. This will continue to give faculty and their stakeholders accountability information that could support continued funding of this educational program on local, state and national levels.
REFERENCES


Available online at http://www.joe.org/joe/1984july/a3.html


This instrument will be used to evaluate the LSU AgCenter Louisiana Master Gardener Program. Bobby Fletcher, Jr. is currently working on a dissertation to assist the LSU AgCenter in improving this statewide educational program. In addition to this pre-test, you will also receive a post-test at the conclusion of the Master Gardener training. Thank you for participating in this and remember that your responses will be kept confidential.

Name: __________________________________________________

Parish: __________________________________________________

Date: _____________________________________________________

What is the highest level of education you have completed? (check one)

   ____ Less than high school
   ____ High school graduate or GED
   ____ Technical school, business school, some college or Associate Degree
   ____ College (BS/BA degree) or beyond (advanced degrees)

What is your age? (check one)

   ____ 18 to 34 years
   ____ 35 to 49 years
   ____ 50 to 64 years
   ____ 65 to 74 years
   ____ 75 and over

What is your gender: (check one)

   ____ Male   ____ Female

What is your ethnicity: (check one)

   ____ African American/Black   ____ American Indian
   ____ Asian   ____ Hispanic/Latino
   ____ Caucasian/White   ____ Hawaiian/Pacific Islander
   ____ Other _________________________
1. Please circle the number that represents your current knowledge in the following subjects:

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</tr>
<tr>
<td>Soils</td>
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<td>4</td>
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<td>Turf (Lawn care)</td>
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<tr>
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<tr>
<td>Plant Diseases</td>
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<td>Vegetable production</td>
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2. List all Best Management Practice’s (BMPs) you are currently using in your lawn, landscape or garden:
3. This type of plant completes its entire life cycle, from seed germination to seed production, in one growing season (circle one):
   a. Annual
   b. Biennial
   c. Perennial

4. List three principal functions of roots:
   a. 
   b. 
   c. 

5. The most common symptom of drought stress in plants is ________________.

6. The insects body is composed of three parts, please name them:
   a. 
   b. 
   c. 

7. Insects help to produce fruits, seeds, vegetables and flowers by ________________ the blossoms.

8. Poorly drained soils account for many plant problems.
   ____ True  ____ False

9. The leaf’s most important plant function is to (circle one):
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10. These microscopic, filamentous plants that lack chlorophyll and derive much of their energy from living organisms or non-living organic matter (circle one):
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   b. Fungi
   c. Virus

11. The middle number (10) on a bag of fertilizer with an analysis of 6-10-4 represents which nutrient (circle one)?
   a. nitrogen
   b. potash (potassium)
   c. phosphate (phosphorus)

12. A weed is simply defined as:

13. Weeds can be spread by the following means:
   a. 
   b. 
   c. 

14. Perhaps the single most important cultural practice associated with lawn maintenance is ____________________________.

15. This provides the physical anchor for the plant to stand upright (circle one):
   a. Stems
   b. Roots
   c. Leaves
16. A 7.6 pH is an example of an acidic soil.
   ____ True          ____ False

17. Placing a layer of organic or inorganic material on top of the soil to prevent weeds is called ________________.

18. A measurement which expresses the degree of acidity or alkalinity of soil or growth media is called __________.

19. The __________ printed on or attached to the container of pesticide tells how to use the product correctly and what specific safety measures need to be taken.

20. How many times should an empty pesticide container be rinsed prior to being disposed of?

21. Most diseases need free standing water and warmth for active growth.
   ____ True          ____ False

22. Which grass requires the most maintenance for best performance (circle one)?
   a. St. Augustine
   b. Centipede
   c. Zoysia
   d. Carpet

23. Vegetables can be successfully grown (circle one):
   a. Spring & fall
   b. Spring & summer & fall
   c. Spring & summer & fall & winter
24. What is the best flowering winter annual for landscape beds (circle one)?

   a. Marigold
   b. Gardenia
   c. Pansy
   d. Salvia

Thank you for taking the time to fill out this information.

Made available by: Bobby Fletcher, Jr., Area Agent (Horticulture) LSU AgCenter
bhfletcher@agctr.lsu.edu

2004 Louisiana Master Gardener Evaluation Survey
Post-Test

This instrument will be used to evaluate the LSU AgCenter Louisiana Master Gardener Program. Bobby Fletcher, Jr. is currently working on a dissertation to assist the LSU AgCenter in improving this statewide educational program. In addition to this pre-test, you will also receive a post-test at the conclusion of the Master Gardener training. Thank you for participating in this and remember that your responses will be kept confidential.

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Made available by: Bobby Fletcher, Jr., Area Agent (Horticulture) LSU AgCenter
bhfletcher@agctr.lsu.edu
APPENDIX B

LETTERS TO MASTER GARDENER COORDINATORS

January 15, 2004

TO: Louisiana Master Gardener Coordinators

RE: 2004 Louisiana Master Gardener Research Project

Thank you for agreeing to participate in this research project that will enhance the Louisiana Master Gardener program as well as our ability to evaluate and improve this educational process. The survey will be two parts:

1. Pre-test administered at the first session prior to educational lessons being presented, and

2. Post-test administered at the last session after all educational lessons have been completed.

Once these surveys are completed mail the hard copies of the pre and post-tests to:

Bobby Fletcher, Jr.
402 West 5th Street
Thibodaux, La 70301

After the data is coded in and received, Dr. Krisanna Machtmes and Bobby will run the data and provide each coordinator at least one “Impact Statement” to help you evaluate your program. Dr. Coreil has agreed to pay for the printing costs of the surveys that will be mailed directly to each coordinator prior to the first session of your 2004 Master Gardener program. The Word file of the pre and post-test is attached. Hard copies will be mailed once we know when your program will be held.

The following information is needed as soon as possible:

1. The beginning and ending dates of your program.
2. The number of participants you expect in your 2004 class.

Sincerely,
Bobby Fletcher, Jr.  
Area Agent (Horticulture)  
La Terre Master Gardener Coordinator

Bob Souvestre  
Instructor (Department of Horticulture)  
State Master Gardener Coordinator

BHF/

c:    Dr. Paul Coreil  
    Dr. David Boethel  
    Dr. David Himelrick  
    Dr. Michael Burnett  
    Dr. Krisanna Machtmes  
    Dr. Jeff Kuehny  
    Dr. Satish Verma  
    Regional Directors  
    Appropriate Parish Chairs  
    Mr. Robert Souvestre

__________________________
COORDINATOR CHECK LIST

___ Emailed 2004 Master Gardener class dates and expected attendance to Bobby

___ Received Pre and Post tests from Bobby, pre (buff color), post (lavender color)

___ Administered Pre-Test at first 2004 Master Gardener session

___ Administered Post-Test at last 2004 Master gardener session

___ Mailed hard copies of pre and post-test to Bobby

___ Received “Impact Statement” after program was completed

Mailing address:

Bobby Fletcher, Jr.  
LSU AgCenter  
402 West 5th Street  
Thibodaux, La 70301

Email: bhfletcher@agctr.lsu.edu  
Cellular number: 985-791-6731  
Office number: 985-446-1316

THANK YOU FOR YOUR SUPPORT!!!!

98
December 16, 2003

MEMORANDUM

TO: Louisiana Master Gardener Coordinators

RE: 2004 Louisiana Master Gardener Research Project

The Louisiana Master Gardener Program is very important in transferring research based horticultural information to volunteers who will share this data with our clientele statewide. This system can greatly enhance the consumer horticultural educational outreach program and help to develop the volunteers who participate.

The impacts of this program are very important and play a critical role in increasing the viability of the LSU AgCenter while making positive changes in the volunteers and citizens reached. An important research project is attached that will enable the AgCenter to measure the impacts of the Louisiana Master Gardener Program.

I encourage your support of this survey that Bobby Fletcher, Jr. will be using as part of his dissertation. The complete details are included with the attached survey.

Sincerely,

Paul D. Coreil
Vice Chancellor and Director

PDC/

c: Dr. Ken Roberts
   Dr. David Boethel
   Dr. David Himelrick
   Regional Directors
   Appropriate Parish Chairs
   Mr. Robert Souvestre
APPENDIX C

LOUISIANA COOPERATIVE EXTENSION SERVICE
ADMINISTRATIVE REGIONS
APPENDIX D
BEST MANAGEMENT PRACTICES LISTED BY PARTICIPANTS
2004 LOUISIANA MASTER GARDENER PROGRAM

1/ Site Analysis, Planting, Landscape Design, Soil Sampling (Pre)

- Plant
- Controlling pH
- Working soil
- raised beds for good drainage
- dead heading
- try to plant according to plant need
- dead heading
- aeration of lawn
- have plants to help control water runoff & erosion
- raised beds
- trying to suit plant to site; raised beds
- sun lite
- plants that grow well in the area
- planting plants that can grow naturally w/o being pruned (for appearance); planting plants that will grow happily in this area
- raised bed planting
- try to grow plants suited to conditions for improved plant health & lower maintenance
- tilling
- raised beds
- using the best soil available for my beds; rotation of veg. crops
- mineral balancing in soil – n-p-k (co-rg) sulphur –iron-mag.-copper-zine/etc; using
- Put plants in the right spots; sun, well drain soil (African Iris, Roses, Rosemary); filter shun/shade (ferns, Japanese red maple, some ginger); med sun/well drain soil (butterfly ginger/shell ginger); sun (most of the palms) tree
- low water plant ???
- prepare beds for spring planting
- prepare soils in fall & winter for spring; rotation of plants
- soil amending
- soil analysis
- plant in time manner; trim dead heads when applicable
- periodic soil testing
- soil sampling to apply proper amount of fertilizer to reduce run off
- Plants where my plants can grown in part sun or shade in which in need
- prefer native plants
- compatible plantings for soil, water, sun
- beds for roses
- aerating
- Pay attention to cold hardiness; avoid very invasive species; pay attention to cultivars when selecting plants; prepare soil before planting
• Prepare soil yearly before planting
• native planting
• preparing soil for planting; selecting best type of plant for sun/shade
• rotation of beds & vegetables
• crop rotation
• turning soil
• Start with good soil/bed preparation; raised beds to improve drainage; Choose plants well adapted to local environment to improve chance of garden success
• attention to needs for sunlight and drainage
• shade planting
• Not planting the same annuals in same location annually
• always soil test before planting
• soil sample; aeration of soil

2/ Irrigation (Pre)

• water
• water
• watering often
• water
• installed water system for flower beds, set on timer for a.m. watering – times can be turned off for periods of plentiful rainfall
• water yard & plants
• water
• irrigation
• If it’s not wilted – don’t water it!
• moisture control
• irrigation
• water as needed
• Good irrigation system
• water appropriately, either manually or by setting automatic watering on sprinkling system
• irrigating (soaker hoses, etc.)
• irrigation
• using soaker hoses
• watering
• proper water
• watering when necessary
• watering
• water
• deep watering
• watering
• Night (early morning water)
• water
• consistent watering
• water
• watering
• watering
• Working & functional sprinkler system
• watering lawn deeply
• watering
• watering
• regular watering
• Irrigation
• H₂O garden maintenance
• regular watering
• water regularly
• regular watering
• regular watering
• Keep plants water
• not overwatering with a sprinkler system
• water
• I use drip hoses to water plants
• water
• once per week watering if needed
• water
• watering
• regular watering
• watering efficiently
• watering consistently
• watering
• watering
• frequent watering during dry/hot weather
• water
• water
• water
• watering
• water regularly
• H₂O

3/ Fertilization (Pre)

• fertilize
• fertilizing
• fertilize
• fertilizer
• fertilizer on moderate scale
• fertilize
• fertilize
• proper fertilizing
• Lawn – do not fertilize
• Fertility
3/ Fertilization (Pre continued)

- We put 1 lb per year of 13-13-13 around our citrus trees; We put zinc around the base of our pecan trees
- fertilizer
- fertilize regularly
- weed & feed in April - lawn
- organic fertilizing
- fertilizing practices
- fertilizing
- fertilizers
- fertilize
- fertilizing as need
- Weed & feed; fertilizer
- fertilizing when necessary
- fertilizer
- fertilizing
- using recommended fertilizers, etc.
- fertilization
- mostly natural products, Using some good synthetic products (fertilizers); I use no synthetic herbicides or insecticides
- feed in April and so on
- fertilized two time(s) a year w/ time release fertilizer
- fert. regularly
- fertilize
- fertilizing (feeding)
- fertilizing
- fertilize
- fertilizing
- fertilizing
- fertilize
- fertilize as needed
- ? regular fertilizing
- garden – turn over soil – till and fertilize
- organic fertilizer
- regular feeding
- regular feeding
- Feed all plants once flowers, when need
- fertilizer
- fertilize
- fertilization
- weed & feed
- fertilization
- use of fertilizer
- keep record of fertilizer (applications)
• fertilizing on regular basis
• fertilization of lawn & plants
• fertilizing
• fertilizing
• fertilizers
• fertilizing
• fertilizer (liquid) on a periodic basis for lawn & beds; special diet for roses
• Proper feeding of plants
• Fertilize every two weeks – Miricle Grow – in gardens
• feed
• fertilizing
• fertilizer
• fertilize

4/ Pest Management (Pre)

• spraying for insects
• organic gardening
• insect control on moderate scale
• spray plants & grass
• Moderate to low use of pesticides/only when absolutely necessary
• pest control
• pest control; disease control
• apply pesticides by instructions only
• natural pest control; no runoff of agricultural products
• use ladybugs for pest control
• practice strict clean-up to prevent disease spread
• curbing pesticide use
• insecticides; herbicides
• inspection daily or at least weekly
• no pesticide use (hopefully)
• Limited use of pesticides – try to use soap solution for pest control, when possible
• pest control
• spray for pest
• organic gardening
• organic; min. pesticide
• pre-emergent granual in early spring; weed killer in mid spring
• Use of pesticidal soap & Neem oil for pest control
• Organic gardening
• Keep check on insects, disease problems
• pesticides
• insect control
• Organic gardening and lawn maintenance
• regular checking for insects - snails
• Application of proper amount and approved pesticides to reduce run off
4/ Pest Management (Pre continued)

● checking for diseases & pests & taking action as needed
● Insect control
● Disease control w/ proper disposal of infected plants and debris
● insect control
● pesticides
● regular spraying
● use of the least amount of pesticide as possible
● (keep record of) pesticide applications
● Do not use chemicals because we encourage birds, squirrels & grandchildren to use yard.
● physical removal of pests
● being very careful with pesticides and using only when necessary
● pest control
● use the least toxic option first for pest control; Maintain good garden hygiene to prevent disease
● Environmentally safe pest control
● Use snail & slug powder in impatiens garden every two weeks
● safe pesticides
● organic weed & pest controls
● Inspection; evaluate whether any thing should be done; use preferred means of control; period inspection
● determine if it is diseased or doing well in the current environment
● look if there is a problem; what to solve the problem with; good good over all look at each problem. Try to solve.

5/ Mowing/Pruning (Pre)

● prune
● pruning
● mowing lawn to 2/3 its length (St. Augustine)
● prune
● pruning
● just mow the lawn
● pruning
● pruning
● pruning; trimming/cutting (lawn)
● Mow the grass every other week, or weekly
● Frequent lawn mowing
● pruning
● Lawn: mowing, dethatching
● trimming
● pruning
● pruning
● pruning
5/ Mowing/Pruning (Pre continued)

● pruning
● trim trees – cut back crepe myrtles, azaleas, ?
● regular pruning of roses
● pruning
● pruning
● Mowing
● I prune roses & muscadines & trees
● cutting & trimming
● cut often
● trimming
● ? pruning
● proper blade height for mowing; plant trimming
● pruning shrubs
● pruning
● cutting back certain bushes such as gardeneas and hibiscus to create reblooming

6/ Mulching/Weeding/Composting (Pre)

● I use cypress mulch for landscaping. I found if I use a lot & make it about 4 inches thick it helps prevent weeds.
● mulching; weeding
● Remove weeds regularly
● weeding; mulching
● mulching
● mulch
● Weed control on moderate scale
● Maintenance of a compost pile
● Weeds control – by pulling (love to pull weeds)
● mulching; weed control
● weed control
● weeding
● I compost
● weed control
● use mulch; weed as needed
● composting; mulching w/ existing Oak leaves
● composting; mulching
● composting
● composting
● composting; weed control
● weed control; mulching
● mulching
● weeding; mulching
● mulching
• weed
• mulching with ground leaves & pine straw to keep out weeds & keep in moisture
• composting
• Keeping weeds out with pine straws
• Mulch; weed control
• plants thru manual weeding, mulching
• keep clean of weeds
• mulching
• mulching
• green mulch
• mulches; living mulches between rows (experimenting)
• compost; use of mulch to control weeds
• mulch beds
• weed regularly
• mulching; weeding
• mulching
• Recycle lawn clippings & leaves for mulch
• Beds: mulch (pine needle chopped)
• mulching, composting
• weed control; use compost in beds
• mulching
• weeding
• have compost pile; use compost as mulch
• mulching
• mulching
• Weed control
• mulch
• composting
• Mulch in spring & fall
• weed control
• mulching; weeding
• landscape – mulch beds
• using a mulching lawn mower
• mulch
• mulching; composting
• mulching
• mulch for weed control & moisture control
• using chopped leaves & pine straw as mulch
• weeding; mulching
• mulching in beds; mulching blade on mower & not bagging clippings
• mulching; composting
• weeding; mulching w/ pine straw; composting
• weed control
• I put down layers of newspaper before I put down mulch on flower beds to control weeds
6/ Mulching/Weeding/Composting (Pre continued)

● cultivation
● weed
● controlling weeds
● weed
● Controlling weeds by pulling
● weed, weed, weed
● mulching
● mulching; weeding by hand
● mulching; composting; weed control
● mulching
● weed control
● weed control; mulching
● mulch as much as I can
● weeding; mulch
● composting
● mulch (heavy); composting
● reg. weeding
● compost
● compost
● mulch
● weeding
● compost; mulch

7/ Error (Pre)

● I mow my grass & maintain some potted plants under my carport.
● spraying
● spraying
● Using good common sense and reading up on problems in books
● garden – use soil covering & keep the size manageable & close to water & taught my wife to harvest & food prep.
● I read directions; hire a landscaper
● We have a 12” X 4” “sq. foot garden”; We have Sundry plants scattered around our yard.
● I don’t know if I am using any or not! What is BMPSS?
● using good soil
● providing shade where needed
● ? Where to place driveway; sloping driveway
● “French” drain
● bee loving plants near my citrus to help pollination; bird loving plants to help control insects; bird feeder
● soil amendments
● proper drainage
● enrichment of soil; annual planting/seasonal/trees
7/ Error (Pre continued)

- annual planting; spraying as need; I like to keep things as organic as possible
- clean of debris
- the best care I can which means try, try, try again
- dividing/separating, multiplying plants; transplanting; observing
- low pesticide use
- container planting
- barriers; other organic techniques
- Do not use a lot of pesticides
- feed
- (?) I use as much natural as I can. Basic H.
- cover crops (rye grass)
- use of fish emulsion & seas weed extract; no fertilizer, enco?? Propagation of beneficial insects
- Correct garden engineering
- Keep litter picked up
- spraying leaves
- Weekly maintenance
- Maintenance; planting annuals
- all organic
- lawn – should weed & feed; I do water & mow
- planting of annual & bulbs in the fall
- recycling
- maintain good turf in order to reduce run off
- We have many flowerbeds of azalea, spirea, etc. which we fertilize regularly; We use fertilizer on our many potted plants & bring them into a small tent type greenhouse for winter; Mostly centipede grass lawn which we feed sparingly – mow regularly – Small vegetable garden which we plant using transplants & seeds
- use of perennials
- Annuals, shrubs & trees: care and management
- vegetable gardening; flower beds & shrubs in yard
- anything you can use from the feed store – Ha!
- plant bedding plants
- lawn care; garden
- take photos once a month of entire yard
- Every 5 years I focus on re-preparing all my beds (more than I do yearly)
- insecticidal soap
- for 25 years I have lived in an apartment. I moved 1½ years ago to a home with a large (never before gardened) back yard. This is my first time to really have a place to put in a garden and I am still a novice. All my previous gardening has been in planters and pots on a balcony. I have a lot to learn.
- none – except cut grass & occasionally; weed gardens
- bulbs; borders
- organic & natural – what happens, happens
7/ Error (Pre continued)

- Propagation of various plants by stem cuttings (gardenias, azalea, oleander);
- Propagation by bulbs – lilies, ginger, banana
- Internet; books; library; hereditary knowledge; advice from Dan Gill
- All season flowers; landscaping; vignettes; seating in private areas; harvesting day lily seeds & growing them
- Division of plants, tubers, etc.
- Use Diazinon every two weeks on gardening & rose bushes.
- Examine & know what kind of plant it is
- Trial & error

1/ Site Analysis, Planting, Landscape Design, Soil Sampling (Post)

- Soil – testing; site – selection; plant selection
- Tilling; plant plant varieties most suited for Louisiana
- Plant selection; proper soil; correct amount of sun
- Checked soil pH; applying organic matter to soil
- Crop rotation
- Crop rotation
- Proper plants for proper type of soil & light requirements
- Attempting to select the best plant for the location
- Soil mixture – to have good combinations, especially in flower beds & yard – correct drainage; plant things in correct areas – such as sun, shade, too much moisture – too dry
- Raised beds; amending soil for quality/texture/good drainage; planting appropriate plants for landscape – time of year – location; knowledge of pH and choose plantings that are appropriate for the soil type
- Planting what’s appropriate for our zone, location in yard (sun-shade); raised beds for proper drainage
- Crop rotation
- Dead heading
- Airating; tilling
- Now plan to have soil tested; use of organic matter in flower beds;
- Using good culture practices to help promote the health of the plant trying to lessen the stress factor
- We use raised beds in our landscape; Plants recommended for our climate & most disease resistant; We pinch, prune & dead head for healthy plants & try to use chemicals on a limited basis due to a butterfly garden.
- Use plants resistant to disease; avoid overcrowding of plants (prune or trim) to let light in, disease out
- Selective plants
- Planting disease resistant plants
- Dead heading
- Raised beds; good drainage
- Raised beds – for good drainage
- raised beds
- proper location of plants/trees; appropriate size & design; proper time of year to plant
- plant rotation; aerating
- raised beds
- raised beds; rotation; putting in plants according to amount of sun
- all natives – no exotics
- shade trees to cool my house
- proper planting – site – depth - time
- garden clean up, planting plants for my area, resistant varieties, using now; increasing soil texture & drainage
- location siting; well drained soil
- soil testing; proper bed preparation; raised beds
- pH test
- if I have shade put shade plants, etc.
- Soil test – so glad I was informed and the resources fr. LSU AgCenter
- raised beds; location;
- bed prep.
- Bed preparation
- Raised beds; Soil testing – amendments if needed; choosing right plants
- Use of correct cultural requirements (ie – correct sun, shade, water, etc.) to promote healthy plants.
- Correct soil preparation.
- Soil preparation – soil testing; bed preparation; correct selection of plants for specific bed
- Good bed prep.
- Good bed preparation
- Soil testing before planting
- Soil testing; bed preparation; plant selection
- raised bed
- Soil testing
- Got pH for 1 section; check for disease often
- Plants selected according to appropriateness for location
- raised beds
- get a soil sample ??? it ??????
- Proper selection of plants to the site
- Planting beds – raise & correct pH for plantings desired, add amendments, till in & plant according to plant needs i.e. sun, shade, wet/dry soil areas; proper spacing between plants
- Keeping all standing water eliminated
- choosing best bet bedding plants for soil cond, drainage, sun/shade & season
- Tilling & amending beds
- Rotating vegetable garden area
- drainage; crop rotation
- Plant according to plant needs
- crop rotation; soil testing; raised beds
- Dead heading when ready; Soil analysis with correction
Rotating crops
soil testing
soil testing

Pull soil sample so that I know the proper amount of fertilizer to apply; Use raised beds to give better drainage
Using plant material appropriate to location (sun, shade, etc.) in garden
plant appropriate plants for area – shade, sun
soil test

I am using our soil test to amend my soil & try to get my gardens ready so that maybe my garden can one day be on the tour of gardens
scout for insects weekly
soil test

appropriate grass for my location & soil; Xeriscaping where possible; Recommended plants for sun or shade preference; Disease resistant varieties planted when I have the choice.

Had soil tested
Planting plants together with similar water needs
crop rotation
selective planting; learning more landscape design; improve on growing different varieties of vegetables
Improving the soil; improving drainage
soil testing; correct selection of plants
bed preparation prior to planting; submitted 2 soil samples today!
deading; using soil analysis to determine soil needs
soil test
choosing correct plants for locations
deading if needed
rotation
took soil sample in May
planting trees properly
managing location of trees for site preparation & soil management
using recommended landscape ideas to improve the beauty of my yard
Sent for soil analysis; reworked 2 flower bed properly & replanted all fall bedding plants
Planting plants that need similar amounts of sun
deading
Buying best strains of a plant offered
Rotate planting of annuals in locations
deading

2/ Irrigation (Post)

water
watering
watering
irrigation
• judicious watering
• only water when necessary
• watering
• water
• Limit overhead watering; adequate irrigation system
• when water is needed due to limited rain, water deep, not often
• watering infrequently but deep
• water early, not on leaves (in the day)
• watering as needed
• watering
• I water properly
• watering lawn deeply
• irrigation
• watering
• watering
• not more than weekly, but deep watering when it hasn’t rained
• irrigation at earliest part of the day
• Collect rain water; drip irrigation
• water regularly
• proper irrigation
• water
• I water
• watering
• Water conservation – planning micro-watering system
• Water properly
• watering - irrigation
• watering for turf grass
• irrigation
• water properly
• water regularly
• irrigation
• water
• watering properly
• watering system
• water regularly
• irrigation
• watering correctly (I hope ☺)
• proper watering
• water in a.m.
• watering
• Do not water beds & lawns lightly – let plants root system develop better by less frequent but more water occasionally.
• regular watering
• Watering lawn with <depth & > frequency
• watering deeply
• drip watering
● Have adjusted my sprinkler system to be most advantageous to my lawn, trees, & beds.
● irrigating
● deep watering less frequently
● watering
● Deep watering when necessary
● watering
● watering
● watering properly – lawn & flower beds
● water @ appropriate times
● water when needed only
● deep watering
● proper watering
● watering
● watering
● deep watering as needed
● deep watering
● watering 1”/week
● irrigating properly
● BMPs in my garden include watering
● correct watering
● correct water
● watering
● watering
● watering
● watering
● watering
● water
● watering in the morning
● Water as needed
● 1” of water per week – 6” deep
● irrigation
● watering 6”, less often
● watering
● watering
● watering
● Watering as needed with a longer watering to go deep into the soil.

3/ Fertilization (Post)

● fertilizing
● fertilization
● fertilizing
● fertilizing
● fertilizer
● slow release fertilizers
● fertilizing
● fertilize when necessary
● fertilizing
● For my lawn, I am fertilizing 3 times a year.
● following fertilizer instructions when fertilizing
● We use time release fertilizers & every 3 months fertilize all plants. Also use aluminum sulfate for azaleas and organic gardening when possible.
● We zinc our pecan trees & have an active fertilization program for our trees & flowers.
● fertilizing
● fertilizing as needed
● fertilizing
● proper fertilizing
● fertilizing
● feeding
● slow release fertilizer
● fertilizer use
● use of organic fertilizers & amendments
● fertilize
● fertilize
● fertilize
● fertilizer
● fertilizing
● fertilization
● fertilization
● fertilization
● fertilization
● fertilizer
● slow release fertilizer
● feeding
● fertilization
● fertilizing correctly
● fertilizing properly & at the right time
● fertilization
● fertilize as needed
● fertilization
● pre-emergent granuals in spring
● fertilizing
● Fertilize – correct ratio
● Feed lawn in spring
● Fertilize according to plant requirements
● fertilizing
● Turf feeding
● fertilizing
● fertilizing
● fertilization
● fertilizer
● fertilizing
● fertilizing turf grass & flowers
• Fertilize according to soil sample results
• fertilizing
• fertilizing
• fertilizer
• fertilizing
• Fertilizing at appropriate time
• fertilizing
• feeding
• fertilizing
• Fertilizing
• fertilizing ornamental beds
• fertilizing appropriately
• winterizing lawn
• fertilization
• when to fertilize
• fertilizing
• fertilizing
• fertilizing at recommended levels
• fertilizer
• fertilizing
• Fertilizing on schedule
• fertilization
• fertilizing
• fertilizing

4/ Pest Management (Post)

• observe & spray for pest & weeds as needed
• wearing all (ppe) personal protective equipment; making sure all tool are clean; reading & understanding all labels
• insect and disease control
• applying pre & post herbicides
• insect control
• appropriate pesticides for plant; use of ladybugs for harmful pest control
• glyphosate
• pest control
• selective pesticide use
• correct insect and disease control in lawn and garden & landscape
• only use pesticides when absolutely necessary
• monitor insects, plant diseases in beds
• weed control in pre & post-emergence herbicides
• weed control spray rotation
• proper application of pesticides and only when necessary
● using integrated pest management program when using pesticides; monitoring the problem; least toxic treatments first; removing diseased leaves or plants, etc.; inspecting plants on a regular bases looking for potential problems; reading all and following label direction
● mix in with a pre-emergence herbicide like Eptan; follow up with Amaze or Preen (3 months); a post emergence herbicide can be use. Repeat the process in the Fall.
● pre emergence & post emergence pesticides in the gardens
● remove dead, disease, damage from plants and throw away
● proper pest management
● mechanical (by hand) removal of slugs and weeds and caterpillars; insecticide & scale spray
● responsible pest control
● ladybugs to eat pest bugs; organic gardener primarily – minimal chemicals
● disposal of infected plant materials; use of organic insect & disease control
● planting disease resistant varieties
● careful use of pesticides
● reading labels now more than before
● follow directions on bottles, labels
● Read labels on pesticides, fungicides, and follow them.
● correct pesticide usage
● pesticide (mechanical & chemical)
● Identifying diseases & treatment of
● Pest control
● pest/disease control
● weed ID & control
● Routine inspection of plants for pest/disease problems
● Use least toxic method of controlling pests
● Proper ID of problem before treatment; Improved sanitation practices
● Site inspection; Plant inspection; Insect Control – specific rather than spray & pray; Fungus control
● keeping all insects/fungus under control
● inspecting garden & lawn frequently for insect damage & disease; Discrimete use of pesticides
● spraying early in the morning or late in the evening to prevent drift; removing dead plant material
● insect control
● Checking for insects on shrubs; Spraying pesticides only when insects are destructive.
● scheduled pesticide application
● pest control by spraying infected plants; putting out pre-emergence weed control
● control pest
● pesticide & herbicide use
● Organic gardening; beneficial insects
● pest control (spraying herbicides & pesticides)
● apply appropriate chemicals only after problem has been diagnosed
● use of beneficials for insect control
● Apply herbicides on yard at proper rates according to the label
• keep garden waste cleaned up to prevent spread of disease & insects
• removing wastes – dead leaves, flowers, etc.
• use pesticides sparingly
• Destroying plant cuttings to prevent spread of diseases
• use of less pesticides
• organic pest control
• safe pesticide applying
• identification of weed & diseases & insect damage & treat accordingly
• inspecting for early detection of “pests”
• applying pre & post emergent herbicides
• reading & following pesticide label
• I also look for disease or pests that may damage plants.
• applying pre & post herbicides
• correct storing of chemicals
• try not to overuse insecticides
• dispose of diseased plant material to prevent spread of disease; use the least toxic pesticide first to try to manage disease; disease/pest management instead of control; Follow instructions on label for safe pesticide use
• identifying lawn problems – correcting it; identifying disease & pest problems & correcting it
• limited use of pesticides; careful use of pesticides
• insect control
• know how to spray for insects
• pesticide safety; entomology
• Keeping garden clean of weeds & dead plants
• watching weekly for insects/diseases
• Inspecting regularly
• Insecticides, fungicides, etc. if absolutely needed
• check weekly for pests; only apply pesticides to control
• selective/non selective herbicides insecticides

5/ Mowing/Pruning (Post)

• I have someone weed eat for me and help cut back my azaleas in the spring.
• dead heading
• proper cutting techniques on lawn
• Lawn – mow regular; prune
• trimming
• mowing every 5-7 days with mower height 2-3 inches
• mowing grass @ appropriate height
• using proper pruning practices; proper mowing practices; proper cutting height
• The lawn is cut with a mulching mower
• cut grass proper height
• mowing
• pruning as needed
• mowing lawn frequently at correct lengths
● proper pruning of trees
● pruning
● mowing
● mowing, edging, weed-eating of grass
● Proper pruning techniques & similar needs plants in similar areas.
● proper mowing height
● cutting at correct height
● pruning; mowing
● Proper mowing
● correct lawn mowing
● Use correct mowing level; Use sharp blades
● Pruning
● Mowing at correct height; pruning if needed
● mowing lawn properly
● Proper pruning
● mowing
● Mowing turf
● mow lawn height according to type planted, cut 1/3 each time with mow & with sharp blade
● Proper & timely pruning of shrubs & trees
● tree pruning
● mowing height
● Cutting lawn at a better height
● correct height to mow grass
● trimming; current mowing heights
● proper length when cutting grass
● Pruning
● mowing
● pruning
● Mowing proper height
● mowing
● pruning
● lawn - mowing
● vertical mulching; pruning
● mowing to correct height
● pruning
● Mow grass at proper height & frequency so that I don’t cut more than 1/3 of block
● Pruning at appropriate time
● try to use correct pruning methods
● mowing
● proper mowing height for grass type
● Mowing grass at high levels
● mowing @ higher levels; pruning
● Mowing
● mowing at proper height; cutting only 1/3 of grass blade
● mowing at proper height

120
● proper mowing heights
● correct mowing
● mowing
● grass cutting
● mowing regularly (only removing 1/3 of height at a time)
● mowing at proper height
● Mow turf grass @ proper time to proper height
● correct mowing heights
● mow at adequate height
● trimming, pruning
● pruned as required
● mowing
● 1/3” grass cutting
● proper cutting heights to prevent the lawn to burn out
● pruning
● mowing grass
● cut grass properly

6/ Mulching/Weeding/Compost (Post)

● weed control
● prevent weeds using herbi(cides); Lay plastic/mulch/compost
● mulching
● Keeping it weed-free; mulching
● mulching
● composting
● periodic weeding
● mulching, weed control
● weed control
● mulching, composting
● Do preventive measures – to try to control before it happens – such as weeds
● mulching
● mulching
● Landscape = mulch
● mulching
● weed control; mulching
● mulching
● mulching
● composting; mulching
● allowing some of the grass to fall upon lawn, returning nitrogen to the soil
● remove weeds
● mulch pile; A good Humus as mulch or pine straw helps conserve moisture in the soil
● compost pile; mulch mow
● mulch; use mulching blade; composting
● mulching
mulching; composting; weeding as needed
mulching; weeding
mulch
composting
mulching; weeding
use of mulch to prevent root rot
mulch
composting; mulching
compost
composting; mulching
collect grass clipping to compost
mulching
weeding
Mulch, Mulch – already can see a difference with the pine straw in veg. garden
mulch
mulching; weeding
Using mulch (bought); Recycling garden “wastes” into mulch; not bagging grass cuttings, but letting them stay in grass.
Mulch flower bed
mulches
Use of mulch
Mulches
I keep it weeded & mulched a lot.
weeding
weeding; mulching
mulching; controlling weeds
mulching
mulch; weed control
weed often – for strays – etc.; Have place black covering on all flower bed – around trees - & placed mulch on top.
mulching
mulch
Mulch to control weeds; compost
Weeding
Composting
mulch beds & shrubs to retain moisture as it rots it provides nutrients for plants – also reduces weeds & beds are more attractive
mulching
Producing mulch & compost
mulch
Composting; mulching
weeding; mulching
mulching
Have hand-pulled all (or most) of weeds in garden bed; Have applied 2-3” of cypress mulch on my garden beds
Keeping weeds and debris out; mulching to maintain moisture
• mulching
• Compost in beds for improving soil structure
• mulching
• Weed control (chemical & non-chemical)
• Composting
• Weeding; mulching
• mulch flower beds & trees, composting; weeding
• mulching; compost
• Weed control; mulch; composting
• mulching; amending soil; composting; weeding
• mulching
• composting; cleaning weeds and dead plant material from planting areas
• weed control; mulch
• mulching
• composting; mulching
• Mulch beds to reduce weeds & conserve water & reduce erosion
• Mulching all flower beds; Liming and weeding and fertilizing lawn
• use mulch; active compost pile (new activity)
• composting
• weeding
• Created compost pile; Mulching beds
• weed control
• re-cycle fallen leaves into compost: use organic substances – cotton, trash, chicken manure
• mulching
• Mulching with pine straw which will break down in the soil
• mulching
• mulching; composting; weeding
• controlling weeds; composting
• mulching
• trying to keep weeds down
• mulch mowing
• weed control
• mulch
• mulching
• weed control
• mulching
• mulching; composting; weeding
• mulching
• mulching
• pulling weeds or mowing them or using proper herbicide
• weed control (hand)
• mulching; weeding; composting
• mulching
• mulch – compost
• weeding
● composting; mulching
● using compost in garden
● mulching
● compost
● composting & mulching
● mulching around plants & trees
● mulching; weeding; composting
● weed control
● mulch w/ pine straw all shrubs, trees and beds; in process of building compost bin w/ 2 compartments
● mulching, weeding
● weed control
● Adding compost & mulch
● pulling weeds
● Weeding regularly
● heavy mulch
● reuse plants as fertilizer – tilled under
● mulch; compost
● mulching
● adding mulch to flower beds to improve moisture retention; starting to compost plan in backyard
● mulching
● weeding; mulching
● mulching
● Mulching for water infiltration

7/ Error (Post)

● season of year; good drainage
● harvest crop/enjoy beauty of plants
● good housekeeping
● good soil; turf management
● time of year, wetness
● ground cover; garden – same as above
● planting; dividing
● Reducing need for synthetic fertilizers
● gathering the correct information concerning the problem; taking the correct action; keeping good records; using good housekeeping practices; using proper safety precautions
● I don’t have a garden at the present time. Plant the flowering plants; NB * Once I have my garden, I know I’ll perfect the BMPSS. N. B. I’d like to do more bands on activities to enable me have more experience. I’m almost there. I’m interested in participating in other programs or taking classes in Horticulture or Agriculture. Thanks!!
● growing irises & banana trees in lower part of back yard
● drainage
● dead heading
• identify problems – treat with caution and protect oneself
• have driveway slope for drainage
• termite baits
• using preventative; maintenance projects
• preventative disease control; plant selection
• spraying
• clean out debris
• ask questions if I don’t know what my problem is w/ plant, soil, etc.
• using what God has put there; They were researched – Use safety when using them, ex: gloves, no wind
• Ask questions from those with experience.
• trying to establish new beds & keep out Bermuda grass
• research
• if I have a dying plant, I find out why
• turf; vegetable production; fruits & nuts
• Use plants that ??? to ???; vegetable plant ???; fertilize with ?????, sea kelp & ???
• remove or de-thatch prior to feeding; plant for 3 season blooming
• cleaning up all dead litter, branches, picked up
• spraying
• spraying
• reading labels
• planting annuals & perennial
• Clean up of debris
• killing weeds
• repotting overgrown containers
• control weeds
• Spraying for insects
• organic matter; spraying
• Have moved to a new property; there is no landscaping – no plants or flowers and shrubbery, no grass
• dividing and sharing plants/bulbs
• dividing
• transplanting
• herbicides (Roundup)
• learning to grow more bushes & shrubs instead of flowers only; would like to learn
  more about starting a fruit orchard
• I am currently planning a garden but have not yet begun work.
• planting ? grasses; planting bedding plants
• Safety
• lawn maintance
• organic, biological & ?
• Have just started digging beds. Have not been doing anything else but cutting & edging
  the grass. I have begun drawing a plant to start beautifying my yard.
• not girdling trees with mower or weed eater
• maintaining tools
• cover crops
● intensive gardening
● fencing
● don’t work in garden when wet
● get someone else to do it
● trying to set up my spring garden
● propagating plants as directed
● don’t nick trees w/ weed eater
● I would be dishonest if I said I was using anything. I do manage to keep the lawn mowed but that is about all.
● LSU AgCenter
● Don’t have landscape or garden yet – new house, new construction
● home was purchased recently – no garden yet
VITA

The author was born October 17, 1963, in Nacogdoches, Texas, and is the son of Bobby and Barbara Fletcher. He graduated from Covington High School in 1982 and completed the requirements for a Bachelor of Science Degree in agri-business from Southeastern Louisiana University in 1986 and a Master of Science from Louisiana State University in 1994. He received a horticulture specialty and specialized assignment in horticulture from the LSU AgCenter on July 1, 2001.

He was employed with Winn Dixie, Inc. from March 1984 as a management trainee until March 1989 in Mandeville and Slidell, Louisiana. In March, 1989, he took a position with the LSU AgCenter as assistant county agent in Terrebonne Parish until September 1991 when he transferred to Iberia Parish as assistant county agent. He was promoted to associate county agent on July 1, 2002, while in Iberia Parish and full agent on July 1, 1997. In November of 1998, he transferred to Thibodaux as area horticulture agent serving Lafourche and Terrebonne Parishes. His current work assignment covers consumer and commercial horticulture programming areas for Lafourche, St. Mary and Terrebonne Parishes as well as supervising the La-Terre chapter of the Louisiana Master Gardener program since 2000.

The degree of Doctor of Philosophy will be conferred at the May 2005 Commencement ceremony.