

**THE EFFECT OF MASS MEDIA ON THE SHORT-TERM
COGNITIVE DEVELOPMENT OF THE PARTICIPANTS AT A
TARRANT COUNTY EXTENSION GARDEN SEMINAR**

A Record of Study

by

DOROTHY M. WOODSON

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

May 2005

Major Subject: Agricultural Education

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ABSTRACT

The Effect of Mass Media on the Short-term Cognitive Development of the Participants
at a Tarrant County Extension Garden Seminar. (May 2005)

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The majority of the Texas population now lives in urban areas. In rural areas, the traditional Extension audience prefers to receive Extension information at an Extension meeting, from a county agent's visit to the farm, or a farm demonstration. A rural county Extension agent can invite their target audience to a seminar and probably have almost the entire audience attend. In an urban county, most county Extension agents would not even have a location large enough to hold their target audience. The Extension seminar/meeting model has been successful for many years and will continue to meet the needs of the rural Extension audience and most urban audiences. To determine the preferred delivery method in an urban audience and test the delivery method for gain in knowledge, participants at two garden seminars were asked to complete a questionnaire after attending breakout sessions about landscape maintenance practices. The same information was delivered by different methods; newspaper, television, Extension fact sheet, and a presentation. Participants were asked questions about what they learned in each session, how they preferred to received information, what was their primary source for information, how they perceived their landscape knowledge expertise before and after treatment, and about their past contact with Extension. Results indicate a gain in

knowledge from newspaper, video, fact sheet, and presentation; most participants preferred and were receiving most information about landscape maintenance from print media particularly newspaper; participants who perceived their expertise as high before and after the treatment scored higher on the landscape knowledge test; and over half the participants had some previous contact with Extension. The results may be used to guide urban county Extension agents to select education delivery methods to effectively deliver best management practice information to homeowners about landscape maintenance.

DEDICATION

This record of study is dedicated to my husband, Berry C. Woodson, my daughter, Amber L. Woodson, and my son, Jeremy C. Woodson, who have supported my goal with love.

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CHAPTER I

INTRODUCTION

County Extension Agents spend many hours developing and maintaining a good relationship with mass media resources in their counties (Parsons, 1999). Most Horticulture County Extension Agents write weekly newspaper columns, and regularly appear on radio and television (Parsons, 1999). Agents with regular newspaper, radio, and television create a local following. Newspaper, radio, and television are a major delivery method for all County Extension Agents. In a large urban county like Tarrant County with a population of 1.5 million and over 600,000 homes, mass media provides an educational delivery method that reaches a large number of non-traditional Extension clientele. Horticulture County Extension Agents reach more non-traditional Extension audiences because all homeowners are interested maintaining the beauty and value of their homes (Welsh, 1999). Past research has identified newspaper and television as agenda setting, increasing interest in the given subject (Cohen, 1963). This research will look at newspaper and television as an educational delivery method for landscape information and compare these methods to traditional Extension educational delivery methods, such as face-to-face lecture/presentation and Extension factsheet.

This record of study follows the style and format of the *Journal of Agricultural Education*.

Water quality is a major issue in Tarrant County as well as many other locations (Cunningham, 1996a; Cunningham, 1996b). According to five years of research compiled by the city of Fort Worth Environmental Department, city of Fort Worth Water Department, and the Texas Commission on Environmental Quality, the greatest source of non-point source water contamination in Tarrant County is runoff from home landscapes (Cunningham, 1996a; Cunningham, 1996a).

Runoff carries fertilizer, pesticides, and soil from home landscapes into storm drains. Storm drains then carry contaminants into creeks, rivers, and the many lakes in Tarrant County. These lakes were built to supply Tarrant County and Metroplex with drinking water. Tarrant County is part of the Dallas/Fort Worth Metroplex with a population of 5.2 million. Tarrant County is the largest water shed into the Trinity River system, which provides drinking water for a majority of the population of Texas. As the lakes become more contaminated, the cost of providing clean drinking water increases (Cunningham, 1996a; Cunningham, 1996b). As the lakes fill up with sediments, the lakes do not hold the amount of water the lakes were designed to hold. As the holding capacity of the lakes decreases, the water providers in Tarrant County predict a future shortage of water. Focus groups held by the Fort Worth Water Department found that most homeowners do not understand the connection between their landscape maintenance practices, water contamination, and a future water shortage (Cunningham, 1996a – 1996b).

Improper application of fertilizer and pesticides, and improper watering practices create the greatest non-point source of water contamination in Tarrant County

(Cunningham, 1996a – 1996b). According to the Cunningham (1996a; 1996b) reports, homeowners do not want their water bill increased and do not want to contaminate creeks, rivers, and lakes. Extension in collaboration with the Fort Worth Water Department and the North Central Council of Government will play a vital role to educate homeowners about proper landscape practices to avoid future contamination.

Urban Horticulture County Extension Agents have many opportunities to reach large numbers of people through mass media contacts. Well-written instructional articles in local newspapers or a method demonstration on local television about a new practice or method to improve or solve a problem will contact large numbers of people not familiar with Extension (SeEVERS, 1997). According to Vestal (2000), newspaper reporters think university professors are a major resource for current science information. Extension agents can take advantage of this information to develop relationships with newspaper reporters. Newspaper articles and radio provide an inexpensive method to reach very large diverse audiences. Newspapers also post most of their articles on the Web (SeEVERS, 1997). A 1993 survey by American Opinion Research showed 81% considered mass media their primary source for information on science, the environment, and natural resources (American Opinion Research, Inc., 1993). Because journalists are involved in communicating science to the public, they play an essential role in the diffusion of innovations and public acceptance (American Opinion Research, Inc., 1993). According to Denton (1996), 74% of American adults use their local Sunday newspaper as their primary source of information. A mass media

audience will reflect the diversity of a county population better than the average Extension audience (Parsons, 1999).

Texas Horticulture County Extension Agents appear on 22 television programs, 72 radio shows, and write for 31 newspapers with a potential audience of 3,957,455 (Welch, 1999). The Texas Cooperative Extension monthly reporting system records the number of releases written and number of mass media outlets but not the number of contacts. The number of contacts were provided by individual agents who received the information from their media sources. Since large urban mass media outlets survey audience size and demographics in order to provide information for advertisers, these mass media outlets can and do provide contact numbers and demographics for Extension agents.

With 600,000 plus homes in Tarrant County, Extension must use many different methods to reach and teach homeowners about water quality issues and best landscape maintenance practices. Newspapers and television sources in Tarrant County work closely with Extension professionals to provide outlets for diffusion of new and innovative ideas and practices. Two television stations, three television cable outlets, two radio stations, and two newspapers provide regularly opportunities for Extension to provide information and reach a very large and diverse audience.

This research may assist urban Horticulture County Extension Agents focus their delivery strategies for issue-based programs on delivery methods with the greatest success for large populations. Iyengar, Peters, and Kinder (1982) found that television news had a profound influence on what viewers think are important issues. This

influence, called agenda setting by Cohen (1963), is a widely accepted method practiced by politicians and others who try to influence public agendas. Horticulture County Extension Agents may be able use the agenda setting concept to develop mass media targeted at homeowners to teach landscape maintenance practices to avoid water contamination.

Extension's mission is to improve the quality of life by extending knowledge. A primary function of Extension professionals is to provide knowledge and facilitate adoption of new ideas and practices (Seevers, 1997). As change agents, Extension professionals assume responsibility for diffusing an innovation, idea or method and influencing adoption (Seevers, 1997). Extension has historically been and remains a primary source of information for people in rural areas (Buford, Bedeian, Lindner, 1995; Martin, Omar, 1988). Extension professionals conduct needs assessments to identify issues, develop an education strategy to address the issue, evaluate the education program, and identify desired outcome. Every teaching delivery method could address the issues identify by the needs assessment, (Wootton, 1991).

Richardson and Mustian (1994) noted that in rural counties, Extension is a major source for continuing adult education and youth education in the traditional Extension program areas of Agriculture, Family and Consumer Science, and Youth Development. In rural counties, Extension professionals have opportunities to contact a greater percentage of a county population than urban county Extension professionals. Extension professionals create unique education opportunities based on a needs assessment. From the needs assessment, Extension professionals target their audience to the people who

will benefit the most. Extension education is based on informal program delivery to a voluntary audience.

Extension professionals have successfully used meetings/seminars (face-to-face presentations/method demonstrations), bulletins (factsheets), newsletters, and personal contacts (site visits, telephone calls) for diffusing information from the land-grant university to a receptive audience (Rasmussen, 1989; Richardson, 1989; Bouare & Bowen, 1990; Richardson, Mustian, 1994; Richardson, Clement, & Mustian, 1997). As technology has evolved, Extension needs to attempt to provide education using different delivery methods (Richardson and Mustian, 1994; Bouare and Bowen, 1990).

Richardson (1997) found that traditional Extension audiences, such as beef producers, preferred newsletter, bulletin, personal visit, field day and method demonstration while a non-traditional Extension audience, such as county employees, preferred newsletter, newspaper, bulletin, and workshop.

Television provides a delivery method for method demonstrations (how to do) that may actually be better than a traditional face-to-face method demonstration because the camera can focus on details difficult to see by individuals in a large audience (Seevers, 1997). By collaborating with local cable and local television stations, County Extension Agents can produce educational videos with very little cost to Extension. Videos of television segments can be made available to Extension clients and streamed on the Web, which will contact many more than the original television segments.

Iams and Marion (1991) found 67% of University of Arizona employees would rent a video about water quality. Iams and Marion (1991) concluded Extension

professionals should use taped or live television programs to “teach” critical environmental issues. Gamon, Roe, and Campbell (1994) concluded from their research about usage of water quality videotapes in Iowa Extension offices that Extension media specialist need to spend more time promoting videotape as an educational tool.

Schudson (1995) discovered the social interaction between reporter and sources builds confidence in the source. Nordstrom, Wilson, Kelsey, Marezki, and Pitts (2000) found from a focus group gathered to evaluate agriculture educational materials that the use of mass media (television, radio, newspapers) was recommended as a dissemination tool.

Rogers’ (2003) diffusion theory provides a model for the diffusion-innovative process. According to Rogers’ hypodermic needle model, media has the ability to cause direct and immediate effect. Extension professionals as change agents can use media for the agenda settings (Iyengar, Peters, and Kinder, 1982), which will attract innovators and early adaptors and for the hypodermic needle effect (Rogers, 2003)

Research Questions

The following research questions were developed to guide the conduct of this study.

1. Do people in a large urban county gain knowledge from mass media?
2. How does mass media as an educational delivery method for a large urban county with a population of 1.2 million compare to traditional Extension educational delivery methods such as face-to-face and Extension factsheets?

3. Which method of delivery do urban clientele prefer for landscape maintenance information?
4. How is method of delivery preference influenced by personal characteristics?

Purpose of the Study

The purpose of this study was to explore the perceptions of Tarrant County, Texas Cooperative Extension clients with respect to their learning preferences for mass media related to landscape maintenance and to describe the effects of various mass media on clientele's short-term cognitive development.

Objectives of the Study

1. Describe Extension clients by selected personal characteristics.
2. Describe Extension clients by their perceptions of learning preferences for mass media related to landscape maintenance.
3. Describe Extension clients by their perceived level of landscape maintenance expertise.
4. Describe Extension clients according to their knowledge about landscape maintenance.
5. Examine the relationship between Extension clients' knowledge about landscape maintenance score and mass media format (seminar, factsheet, newspaper article, video, control).

6. Examine the relationship between Extension clients' knowledge about landscape maintenance score and selected personal characteristics.
7. Examine the relationship between Extension clients' knowledge about landscape maintenance score and perceptions about learning preference.
8. Examine the relationship between Extension clients' knowledge about landscape maintenance score and perceived level of landscape maintenance expertise.

Theoretical Base

Rogers' (2003) diffusion of innovation theory provides the theoretical base for this study. Rogers' innovation-decision process model, attributes of innovation, and characteristics of adopter categories were considered for this study. In Rogers' innovation-decision process, an individual's innovation adoption behavior goes through five stages: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003). An individual's position in the innovation-decision making process is influenced by prior conditions, perceived attributes of innovation, decision-makers' personal characteristics, and communication channels.

According to Rogers (2003) the five important attributes of innovation related to an individual's attitude toward an innovation and whose stage in the innovation-decision process summarized by Rogers are relative advantage, compatibility, complexity, trialability, and observability. The perceived attributes of an innovation would vary according to individual's different personal characteristics (age, gender, level of education, professional area, socioeconomic status, communication channels, etc.).

Perceptions about attributes of innovation will influence adoption behavior. Based on adoption behavior, Rogers (2003) divided innovation adopters into five categories: innovators, early adopters, early majority, late majority, and laggards. Each category of adopters have different characteristics according to their socioeconomic status, personality values, and communication behavior.

Significance of the Study

If this study was carried out successfully, it may:

1. Contribute to a better understanding of mass media's role in a large urban county;
2. Provide guidance to County Extension Agents who want to use mass media to focus their education delivery efforts for large audiences;
3. Enrich the diffusion of innovation theory;
4. Provide a research model for others concerning the use of mass media as an education delivery method.

Definition of Terms

Diffusion of Innovation: The process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 2003).

Education Delivery Method: An activity designed to effect changes, in knowledge, skill, and attitude (Knowles, Holton, and Swanson, 1998).

Mass Media: Is the entire body of media reaching large numbers of public via radio, television, magazines, newspapers and the World Wide Web (SeEVERS, Graham, Gamon, and Conklin, 1997).

Innovation: An idea, practice or object that is perceived as new by an individual or other unit of adoption (Rogers, 2003).

Innovation-decision Process: The process individuals or other decision making unit pass through from first knowledge of innovation, to attitude toward innovation, to decision of adopt or reject to implementation of the new idea, to confirmation of the decision (Rogers, 2003).

Limitations of the Study

A limitation of this study is that only four news media formats (seminar, factsheet, newspaper article, and television) were considered. Other formats of mass media exist. A limitation of this study was that it was a one-shot case study of participants attending one of two Extension seminars. Longitudinal impacts of mass media were not addressed. A limitation of this study was that the target audience was an intact group randomly assigned to one of the four treatments or control groups. Generalizability of findings beyond the target group is unknown.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to provide a review of literature on the use of mass media as a teaching delivery strategy by county Extension agents. The purpose of this study is to explore the perceptions of Tarrant County, Texas Cooperative Extension clients with respect to their learning preferences for mass media related to landscape maintenance and to describe the effects of various mass media on clientele's short-term cognitive development.

In 1862, the United States Congress passed Morrill Act creating the land-grant universities to provide agricultural and mechanical education (Seevers, Graham, Gamon, and Conklin, 1997). The Morrill Act created an affordable higher education system. The 1887 Hatch Act created experiment stations for agricultural research (Seevers, Graham, Gamon, and Conklin, 1997). The experiment stations created research bulletins which were distributed to framers and ranchers. Demonstrations at the experiment stations and later on farms started by innovators like Seaman Knapp, James Wilson, and Liberty Hyde Bailey were the beginning of Extension (Seevers, Graham, Gamon, and Conklin, 1997). The 1914 Smith-Lever Act created the Cooperative Extension Service to disseminate research based information from the land-grant institutions and the experiment stations to people who can use the information to increase their quality of life (Seevers, Graham, Gamon, and Conklin, 1997). Extension has created the largest voluntary adult education network in the United States (Seevers, Graham, Gamon, and

Conklin, 1997). The diffusion of research based information is as much a challenge today as it was in the beginning for all the county Extension agents (Boone, Meisenbach, and Tucker, 2000; Cooper and Graham, 2001; ECOP, 1992; Seevers, Graham, Gamon, and Conklin, 1997).

As the largest adult education network in the United States, Extension has opportunities to act as change agents providing best manage practice information in all the Extension program areas: agriculture, health and nutrition, natural resources, Community development, and 4-H and youth development (Boone, Meisenbach, and Tucker, 2000; Seevers, Graham, Gamon, and Conklin, 1997). Extension has a successful record of providing agricultural information to people who will use the information in rural counties (Seevers, 1995). Providing information in a usable adoptable manner to a targeted urban audience is an even bigger challenge for urban county Extension agents.

Diffusion Theory

According to Rogers' (2003) diffusion theory model there are five stages in the innovation-decision process; knowledge, persuasion, decision, implementation and confirmation. Knowledge occurs when an individual or group is exposed to an innovation and how the innovation will affect them. Persuasion occurs when an individual or group form a favorable or unfavorable attitude about the innovation. Decision occurs when an individual or group decides to adopt or reject the innovation. Implementation occurs when the individual or group uses the innovation. Confirmation occurs when an individual or group reinforce their innovation-decision or reserve a

previous decision to adopt or reject an innovation after learning more about the innovation.

According to Rogers (2003), the innovation-decision process is a series of decisions and actions influenced by prior conditions such as previous practices, needs/problems, innovativeness, and social norms; perceived attributes of the innovation such as relative advantage, compatibility, complexity, trialability, and observability; characteristics of the decision-making unit such as socioeconomic characteristics, personality variables, and communication; and communication channels.

Rogers (2003) found mass media influenced public perception. Rogers called this the *Hypodermic Needle Model*, which causes powerful effects. Rogers (2003) found 52% of potential agricultural adopters used mass media for information regarding innovations. Rogers (2003) defined interpersonal delivery methods as a face-to-face exchange between individuals and mass communication as a delivery method where one individual or a group of individuals reach a large audience. A third delivery method is called computer assisted communication (computers and the Internet) has made distance learning available to a greater number of individuals than ever before. As computer competencies increase, distance education will attract more individuals, (Blacklock, 1985; Boldt, 1987; Dooley, Richards, Lindner, 2002).

Adult Learners

According to Knowles, Holton, and Swanson (1998) there are six core adult learning principles:

1. The learner's need to know
2. Self-concept of learner
3. Prior Experience of learner
4. Readiness of learner to learn
5. Orientation of learner to learning
6. Learner's motivation to learn

Adults learn better when the teacher tailors the education to the ability of the learner and the learning situation (Knowles, et al.,1998).

Grow (1991) noted that adult learners exhibit different capabilities in different learning situations, therefore adult educators need to accommodate all learning stages. Adult educator should identify the learner's stage in order to tailor the instruction and move the students through the stages to become a self-directed learner. Stage one learners are dependent and respond to authority/coach teaching strategies. Stage two learners are interested and respond to motivator/guide teaching strategies. Stage three learners are involved and respond to facilitator teaching strategies. Stage four learners are self-directed learners and respond to consultant/delegator teaching strategies.

The majority of Extension clientele are adults voluntarily attending Extension education programs or seeking information from Extension by other methods (Seever, et al., 1995). While campus faculty meet students in a classroom, publish a syllabus, and use various classroom teaching strategies, county Extension agents conduct needs assessments, plan educational programs with collaborators and stakeholders, design educational programs based on needs assessment and research based information, market

programs to target audiences, implement educational programs with help from collaborators and stakeholders, and conduct an evaluation of the program which is shared with all stakeholders. The knowledge of adult learning principles is important to all county Extension agents so the agents and their committees can use these principles to develop quality educational program. Grieshop, Bone, and Frankie (1990) found there was often a difference between what people thought they wanted to know and what Extension thought they needed to know. Richardson and Mustian (1994) found clientele delivery method choice was both subject and audience specific. Their findings demonstrate how Extension needs to provide education by multiple delivery methods if Extension is going to continue to attract audiences. Extension has a unique opportunity to create educational programs incorporating Knowles adult learning principles and Grow's teaching strategies.

Historically Extension has accomplished the mission of providing research based information from land-grant universities and experiment stations to people who will benefit from the information, (Boone, Meisenbach, & Tucker, 2002; Rasmussen, 1989; Seevers, Graham, Gamon, & Conklin, (1997). In order for Extension to maintain this historical reputation, Extension must use a variety of teaching delivery methods and identify which ones work best for a specific subject, targeted audiences, and for the different situations (Gamon, Roe, and Campbell, 1994).

Fehlis (1992) reported that with 50% of the Texas population in six urban counties, Extension's future in Texas is dependent on effective programs in urban counties. Fehlis pointed out that water quality and conservation are major issues in both

rural and urban counties but Extension must use different resources and delivery methods to provide educational programs to these two audiences. In rural counties, the issues focus on dairy and feedlot manure waste disposal. In urban counties the issues focus on homeowners' improper use of fertilizers, pesticides, irrigation, and yard waste disposal.

Martin and Omar's 1988 study indicated younger Iowa farmers preferred group orientated delivery methods such as Extension community meetings (group face-to-face methods). They found 80% of Iowa farmers attended Extension with 70% satisfied or very satisfied with Extension information and services. Murphy and Terry (1998) found that faculty members at land grant colleges have limited knowledge about electronic technologies but they realized how important electronic technologies will be in the future. Many indicated a lack of competence in the use of electronic technologies and a lack of confidence in their ability to use electronic technologies with their teaching methods. Many indicated a lack of equipment, facilities, and technical support.

Martin and Omer (1990) found that secondary agricultural instructors understand teaching and learning strategies much more than extension educators. Although secondary and extension educators believed competence in teaching is necessary to teach agriculture technology, they did not have the training or the time to train. SeEVERS (1995) found in her assessment of Ohio Cooperative Extension, most Extension professionals were not trained or prepared to be adult educators. As a result of her study, Ohio Extension created training opportunities for all Extension professionals.

Extension's Use of Mass Media

Welsh (2001) reported the possibility of reaching 2,957,455 people through regular mass media outlets with only 19 Texas counties reporting. County Extension agents with regular mass media contacts reported appearing on 22 television programs, 72 radio shows, and writing 31 personal columns. If this sample is multiplied by the other 235 counties not reporting, the potential contact number is more than 400 million. These contacts are continuing contacts not just news releases sent to media outlets.

Mass media represents the only contact with Extension for many people. Warner and Christenson (1984) found from a national survey that 90 percent had knowledge of Extension by listening to radio or watching television. Only 39 percent had attended an Extension education program.

Blacklock (1985) found older adults look for educational opportunities primarily for immediate application, personal satisfaction, and socialization. After conducting an assessment, Blacklock noted older adults in Trempealeau County, Wisconsin, preferred local newspapers, local access cable television, and local radio for information and the best viewing time was 6:00-7:00 p.m., 7:00-8:00 p.m., and 11:00 a.m.-12:00 noon.

Boldt (1987) stated that Extension should deliver more information using many different media sources to reach a more diverse audience. Boldt reported that USDA's *Targeting Audiences* provides research-backed ideas to help improve programs and delivery methods for the information age audience.

Ezell (1989) reported that as the information age becomes the communication age, Extension needs to provide the means to use all the new technologies available to

provide information to clientele. Extension needs to train agents or provide specialist with training to use the innovative communication technologies now available and emerging technologies. The future of Extension as a change agency is dependent on Extension adopting and incorporating the new technologies in the educational process.

When Boone and Zenger (2001) questioned several homemaker focus groups in Kansas about their issues, mass media, and Extension, they found the majority used mass media but considered mass media untrustworthy and the groups thought Extension information was reliable and accurate but more difficult to access. Benedict's (1995) evaluation of news media receiving an Extension manual about food safety concluded a proactive approach is an effective method to working with news media reporters.

Bouare and Bowen (1990a) found that of all the formal and informal instruction methods used by agricultural Extension agents, adult educators, and secondary vocational agricultural teachers in Ohio to teach farmers radio, magazines, television and teleconferencing were the less used methods. Extension agents preferred to use informal methods such as office visits, telephone calls, bulletins, and newsletters. Secondary teachers used more formal methods such as resource persons, classroom instruction, site instruction, and newsletter. Newspaper was the only mass media used by each group.

Bouare and Bowen (1990a) found that Extension agents in this Ohio study thought the most important delivery methods were office visits, telephone calls, bulletins, and newsletters. This study indicated the subject matter agents delivered was not always what they thought was the most important subject. The Ohio agents delivery methods were the methods they perceived to be the most important. Grieshop, Bone, and

Frankie (1990) found there was often a difference between what people thought they wanted to know and what Extension thought they needed to know. Extension market research or needs assessment will identify the gap between what Extension clientele want to know and what Extension needs to teach. Once the gap is identified, Extension educators can create education information to challenge, and promote options and change. Richardson, Clement, and Mustian's (1997) study of delivery methods used by extension in Polk County, North Carolina, showed beef producers (traditional extension audience) preferences were newsletter, bulletin/pamphlet, personal visit, field day and method demonstration and county government personnel (non-traditional audience) preferred newsletter, newspaper, bulletin/pamphlet, workshop, and leaflet/flyer. The conclusion from this study shows county Extension agents must use different delivery methods to target different audiences.

Extension took advantage of the 75th anniversary to market awareness of Extension's past and present throughout the United States to all media outlets. Calvert, Konan, and Bowers (1990) reported that weekly newspapers reported Extension's 75th Anniversary activities more than daily newspapers. One of the conclusions of this research was the need for more training and development of materials to communicate Extension's new and emerging initiatives to news media along with information about current programs. Ruth, Telg, Irani, and Locke (2004) surveyed 62 agricultural scientists and found that most were negative about national news coverage of their agricultural discipline, but positive about local news coverage. Local reporters have an opportunity to communicate and follow up stories with local agricultural scientists, (Telg, 1992).

Vestal (2000) found the relationship between reporter and source is important to the reporter's confidence in the material. Womack (2004) showed creativity by Extension agents was most valued for attracting new (non-traditional) audiences and/or engaging audiences to increase likelihood of adoption of practices. Most creative programs used multiple delivery methods, which may have included some traditional approaches including lecture, newsletter, media, and facts sheets.

Riesenberg and Gor (1989) found agriculture producers preferred to receive information about new and innovative programs by interaction methods such as on-farm demonstrations and site visits. The least favorite method preferred were methods requiring the least interaction such as home study and computer assisted instruction. Rollins, Bruening, and Radhakrishna (1991) found through a descriptive survey of 379 Pennsylvania farmers that they preferred site consultations, demonstrations, tours, and plots to be the best delivery method for environmental issues. Trede and Whitaker (2000) concluded beginning farmers believed continuing education is important to their farming careers, preferred hands on training and one subject factsheets, and relied on relatives, Extension and consultants for information.

Dooley, Richards, and Lindner (2002) found that for distance learning to be successful, students must have the competency to interact with the distance learning technology so the technology is not a barrier to learning. As Extension begins to use the Internet as a major delivery method, traditional clientele who prefer face-to-face contact may be discouraged.

Many homeowners are not aware of the water quality and runoff issues created by improper landscape management practices (Cunningham, 1996a; Cunningham, 1996b). Most homeowners equate the use of fertilizer, pesticides, and irrigation with a beautiful landscape. Most homeowners over fertilize, misapply pesticides, and create runoff by watering too long and too frequently (Salazar, 1997; Cunningham, 1996a; Cunningham, 1996b). When Israel and Hague (2002) compared a participating audience to a non-participating audience of an Extension environmental horticulture program, they found the participants had knowledge of the issue, action strategies and skills, and displayed more self-efficacy than the non-participating group. The participating group had more past association with Extension and networked with friends and family to share information. The participating group had more higher education and more white females than the non-participating group. Hatry (1999) found that since Extension audiences are voluntary, the decision to participate is representative of a behavior change similar to adopting best Managements Practices (BMP).

Laughlin and Schmidt (1995) looked at maximizing program delivery for Extension by partnerships, master volunteer, information center, and regional offices. Laughlin listed all pros and cons for each method. Laughlin concluded that Extension must match individual, community, and emerging needs to the correct educational delivery method to reach people in the emerging technological age.

Maddy and Kealy (1998) point out how Extension can benefit from market research about branding. They suggest Extension use branding just like Cola-Cola. Extension development of repeat customers has to do with presenting quality programs.

Branding is a promise of quality. Nehiley (2001) discussed a four-step marketing plan for Extension education programs. Step one is to conduct an audience inventory (needs assessment). This step identifies and defines who wants to know and what Extension can provide. Step two is to define goals and objectives using a strategy like the SWOT analysis; strengths, weaknesses, opportunities, and threats. Step three is to decide the message, complexity, length, uniqueness, and appeal.

Nordstrom, Wilson, Kelsey, and Matretzki (2000) evaluated the use of focus groups to evaluate agriculture literacy material. They found a focus group was valuable for evaluating the material, identifying the audience for the material and making suggestions for how to make the material available to the audiences.

Swan and Brehner (1994) concluded from their study on the use of interactive video networks in rural high schools that IVN is a good method to teach high school students subjects not being covered in the rural areas because of budget cut backs, decline in enrollment, and smaller tax base. They found a need for funding and in-service training of all stakeholders. Almost 10 years later, distance education and video conferencing is the newest innovation for education and professional development for colleges and universities and businesses (Dooley and Murphy, 2001; Dooley, Richards, and Lindner, 2002; Murphy and Terry, 1998).

Community access channels on cable television provide an opportunity for community information either for an entire program, program announcements, or PSAs. Agents with a regular community access cable television show develop a following (Rockwell and Randall, 1987). Texas Cooperative Extension county Extension agents in

Tarrant County, Texas, produce a community access television show called “Extension in the City” with the assistance of a cameraman and editor at the Fort Worth community access station. “Extension in the City” airs once a day at various times. Tarrant County Extension agents who appear regularly on “Extension in the City” receive feedback from people they meet in the county, and through e-mails, calls, faxes, and letters.

Horticulture County Extension Agent Dotty Woodson (the author of the study presented herein) appears daily on 2 community access shows “Extension in the City” with Charter Cable and “Gardening with Dotty” with Comcast Cable, and on the Sunday morning news on the NBC affiliate, KXAS-TV. Rockwell and Randall’s (1987) evaluation of an Extension television series and concluded a continual show builds a loyal audience and farmers accepted this delivery method. Dennis, Lee and Jenson (1995) concluded marketing is important for Extension education programs on community access television programs. In a presentation to attendees of the National Agricultural County Agents Association Professional Development meeting, Parson (1999) stated that urban county agents must use mass media sources to reach non-traditional Extension audiences. Parson described his use of television and the feed back he received.

With increased recommendations for the use of educational videos for Extension information, Beaudin and Quick (1996) found the need to create an evaluation instrument designed to evaluate videos for instructional content. The evaluation will help County Extension Agents decide weather to use the video as an educational delivery method. Video content must stimulate, motivate, and inform the viewer about how to act on the information in the video (Beaudin and Quick, 1996).

Booth, Telg, Smith and Tomlinson (1992) found that only half of the 52 agricultural communication departments at United States land grant universities had a television news component and that less than one-third of the video news releases (VNR) produced were about agriculture. Audiences for the VNR were targeted by population and geographic characteristics not demographics. Gamon, Roe, and Campbell (1994) found that Iowa county Extension offices like the idea of video tapes to deliver environmental education but required assistance to market and promote the videos, and provide a news release to local media outlets.

Gunderman's (1980) research of the cable television subscribers in Fort Worth, Texas, found the audience demographics to be white, middle to upper middle class, and educated through college. These demographics are very similar to Extension audiences. When Israel and Hague (2002) compared a participating audience to a non-participating audience of an Extension environmental horticulture program, they found the participants had knowledge of the issue, action strategies and skills, and displayed more self-efficacy than the non-participating group. The participating group had more past association with Extension and networked with friends and family to share information. The participating group had more higher education and more white females than the non-participating group. Lang, Blacklock, and Bossing (1986) identified cable television local access channel as a method to reach a large audience in a rural Trempealeau County, Wisconsin. They found 67% of the 2,897 cable subscribers viewed Extension programs, viewers of the Extension programs used information from the program, and

cable subscribers considered community access programs an important part of their television experience.

Iams and Marion (1991) found by surveying University of Arizona employees that safe and plentiful water was the number one issue and renting videos was the number one alternative delivery method in remote rural areas but educational meetings/workshop was a close second. Iams and Marion found that Extension faculty need training to become competent for live or taped television.

After surveying 565 television viewers who had an opportunity to view an Extension groundwater protection television campaign on the 10:00 p.m. news, Mechenich (1991) found 38% of those interviewed recalled seeing the message, 44% could describe the content, 12% increased their knowledge, and 10% changed one or more practices. Correlated to the survey findings to the 50,000 people who watch the 10:00 p.m. news according to the station and Nielson reports, 19,000 may recall the campaign message, 8,500 may accurately describe the content, 6,200 may have increased their knowledge, and 5,000 may have changed practices. Mechenrich concluded the results showed television was a cost-effective delivery method for reaching non-traditional audiences and also facilitated change in practices.

Through experimental research of the evening television news, Iyengar and Kinder (1982) found television news influenced what issues the television audience thought was important by selecting certain topics to feature. They also showed the evening news topic could influence opinion about a presidential candidate. This agenda setting hypothesis was first introduced by Walter Lippmann in 1922 (Baran and Davis,

2000; Lowery and De Fleur, 1983; Jacob, Willits, and Crider, 1992; Gunderman, 1980) who said mass media shaped public opinion by creating “pictures in our heads” of the “outside world.” Bernard Cohen thought the agenda setting hypothesis meant that mass media did not tell people what to think but influenced what people thought about (McCombs and Shaw, 1972). Research of the 1968 presidential election conducted by McCombs and Shaw (1972) showed news media may influence the election by featuring certain issues which the public then thinks are the important issues.

Stevens (1991) look at the practice of using video to capture the annual agricultural situation and outlook conference and using the video as professional development for agents and producers unable to attend the conference. Stevens found agents used the videos to augment their traditional delivery methods. Sunnarborg (1988) found the use of television for 4-H leaders training was time and cost effective to traditional methods. His study said the videos cost \$1,000.00 to produce. According to the community cable station director, the 30 minute programs produced in Tarrant County by the cable community access station would cost approximately \$10,000.00 if produced independently. Extension in Tarrant County is very lucky to have community access cable television stations willing to produce educational programs and air these programs daily at no cost to Extension except the agents’ time and preparation.

Israel’s research (1988) demonstrated the use of a mailed survey versus insert in newspaper and magazine. The mailed survey had the largest response, newspaper second and magazine very little. There was little difference between the responses and

characteristics of the respondents. Newspaper survey could be a good source for a needs assessment. Newspapers are likely to print results of newspaper surveys.

Romero-Gwynn and Marshall (1990) found radio is a good delivery method for Extension education for Hispanic audiences because Hispanics listen to 30 hours of radio a week which is 20% more than the general population. Risdon (1990) found most people think Extension publications are difficult to read and use. She wrote a six step plan for writing understandable Extension publications. Johnson and Verma (1992) found the readability of Extension newsletters were two grades higher than the average read level of the research group.

While nowhere in the literature was found studies about using mass media (newspaper and television) as a teaching delivery method, the literature did explore mass media as agenda setting, (Lippmann, 1922; Lowery and DeFleur; McCombs and Shaw, 1972; Rogers, 2003; Seever, et al., 1997) influencing people to think about topics mentioned in mass media. While Extension spends many human resources, hours, and dollars producing mass media, these sources are not considered education just informative or agenda setting. A goal of making people think about issues is part of Extension mission, providing education to change attitudes, knowledge, and practices is even more valuable. Extension's audience is moving to the city. Extension's audience is busy and they want their information where they have time and need. Extension's presence on the Web will answer many questions but a regular scheduled Extension television show or a regular newspaper column will have a loyal following that can address emerging issues faster than creating a web site or a publication. Mass media

resources are interested in working with university professionals (Boone and Zenger, 2001; Dennis, Lee and Jenson, 1995; Vestal and Briers, 2000). Extension should take advantage of these opportunities to reach more people through mass media.

Figure 1 depicts the conceptual framework of this study. The conceptual framework for this study is based on the theoretical underpinnings of this study and the review of literature. This study measured the participants cognitive knowledge about landscape maintenance after each treatment; face-to-face presentation, Extension fact sheet, newspaper article, and television/video. The study also asked each participant about their perceived level of landscape maintenance expertise after and before the treatments, personal characteristics, and learning preferences.

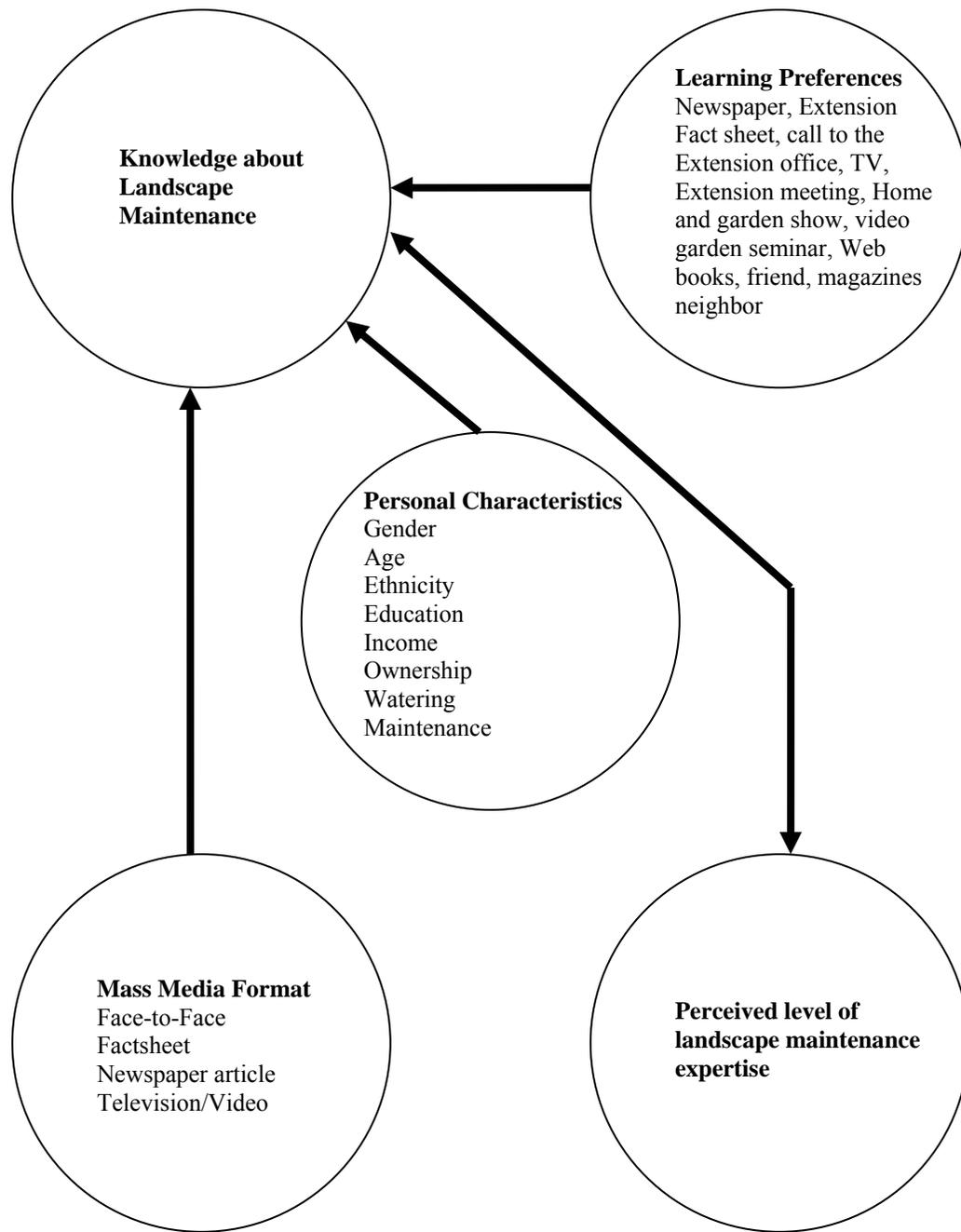


Figure 1. Conceptual Framework of the Study

CHAPTER III

METHODOLOGY

This chapter describes the type of research, pilot test, selection of respondents, instrumentation, validity and reliability, data collection, and data analysis. The purpose of this study was to explore the perceptions of Tarrant County, Texas Cooperative Extension clients with respect to their learning preferences for mass media related to landscape maintenance and to describe the effects of various mass media on clientele's short-term cognitive development.

Type of Research

The research design used in this study was experimental. The study was designed to examine whether people can learn best management practices using Extension's mass media (newspaper and television/video) in an urban county as well as Extension factsheets and face-to-face presentations. The theoretical framework for this study was based on; (1) Rogers' (2003) model of the innovation decision process, (2) Rogers' (2003) characteristics of adopter categories, (3) Knowles' (1998) six core adult learning principles, and Grow's (1991) stages in learning autonomy.

The study has five sets of dependent variables and 8 independent variables. The first set of dependent variables included participants' preferred method to receive landscape maintenance information: Newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and garden show, video, garden seminar,

Web, books, friend, magazine, and neighbor. The second set of dependent variables included participants' perception of their primary source of landscape maintenance information: newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and garden show, video, garden seminar, Web, books, friend, magazine, and neighbor. The third dependent variable was the number of times participants received information from Extension. The fourth dependent variable included the participants perceived landscape expertise about runoff contamination, irrigation management, irrigation audit, native plants, and landscape water requirements. The fifth dependent variable included the participants' knowledge of landscape management practices. The independent variables were gender, age, ethnicity, education, income, own/rent home, irrigation system or no irrigation system, and maintain landscape or hire landscape service.

Four treatments were designed to provide the participants with the same information about landscape and irrigation best management practices. Treatment one was a newspaper article (Appendix B) written by Dotty Woodson, Horticulture County Extension Agent, (Woodson, 2004a) . The article appeared in the Times-Record July 29, 2004. The Times Record is a small weekly newspaper distributed in a few small towns in northeast Tarrant County. The target audience for this study were homeowners in Fort Worth, Texas. The newspaper provided 50 extra copies of the newspaper for this research. Treatment two was a factsheet (Appendix C) about landscape and irrigation best management practices written by Dotty Woodson, Horticulture County Extension Agent, and Amy Williams, County Extension Agent, (Woodson & Williams, 2004) . The

fact sheet had the same information as the newspaper article. The fact sheet has not been distributed except for this study. Treatment three was a videotape of Dotty Woodson's cable television segment of the Extension television show, "Extension in the City". The television/video provided the same information as the newspaper and the Extension factsheet, (Woodson, 2004b). The show was written and produced by Dotty Woodson, Horticulture County Extension Agent, and videotaped and edited by Randall Crossman of Charter Cable. The video was not show on television until after this study. The videotape is available from the Tarrant County Extension office, Horticulture Department, 401 East Eighth Street, Fort Worth, Texas 76102. Treatment four was a face-to-face presentation presented by another horticulture county Extension agent who was provided with a copy of the factsheet, newspaper article, video, and questionnaire so he could be prepared to present the same material as the other treatments. In addition to the four treatment groups, a control group that did not receive a treatment was included in the research design. Each group was asked to go into separate treatment rooms where they read the newspaper article (treatment one) or Extension factsheet (treatment two), viewed the video/television (treatment three), heard the presentation (treatment four), or received no treatment (control). Random assignment to treatment groups or control was achieved through a blind draw of five colored index cards. The researcher was not present in any of the treatment rooms.

As participants registered and entered the lecture hall for the landscape seminars, they were given the top card off stack of shuffled colored index cards. Because of past participation, 160 people were expected, so 160 colored index cards were shuffled in

advance. Before the seminars, an equal number of five different colored index cards were shuffled, stacked, and banded. The card's color represented which treatment or control group the participants were assigned. Yellow cards received treatment one, newspaper. Instruments for treatment one were printed on yellow paper to reinforce the random sample. Blue cards received treatment two, Extension factsheet. Instruments for treatment two were printed on blue paper to reinforce the random sample. Violet cards received treatment three, video/television. Instruments for treatment three were printed on violet paper to reinforce the random sample. Pink cards received treatment four, presentation. Instruments for treatment four were printed on pink paper to reinforce the random sample. White cards were the control and received not treatment. Instruments for the control group were printed on white paper to reinforce the random sample.

Two Master Gardeners were assigned to each treatment room and the control group room. In each room, the Master Gardeners gave a short introduction and instructions. The introduction explained that this part of the garden seminar was a research study for a doctoral student, all information collected would only be used for research, all information is confidential, and voluntary participation indicated consent. The instructions were to read or listen to the treatment, return the treatment to the Master Gardeners, receive a questionnaire, and return the questionnaire when complete.

In treatment room one, the Master Gardeners distributed a newspaper to each participant. Treatment one was held in a conference room so participants were seated in comfortable chairs similar to chairs they would sit on to read the newspaper at work or home. After each participant read the newspaper, they returned the newspaper to the

Master Gardener and received the instrument and a pencil. The instruments were returned to the Master Gardeners when completed.

In treatment room two, Master Gardeners gave the same introduction and instructions and distributed a factsheet to each participant. Treatment room two was set up classroom style to simulate the participant sitting at their kitchen table reading a factsheet received in the mail. After each participant read the factsheet, they returned the factsheet to the Master Gardener and received the instrument and a pencil. The instruments were returned to the Master Gardeners when completed.

In treatment room three, after the same short introduction and instructions, the Master Gardeners showed the video of the television show. Treatment room tree was in the sitting room of the Fort Worth Botanic Garden center. This is a room set up to be similar to a living room or den in someone's home. After each participant watched the video, they received the instrument and a pencil. The instruments were returned to the Master Gardeners when completed.

In the treatment room four, after the same short introduction and instructions, an Extension agent presented the same material covered in the newspaper article, factsheet, and video. Treatment room four was the lecture hall. After the presentation, two Master Gardeners distributed the instrument and pencils. The instruments were returned to the Master Gardeners when completed.

In the control room, after the same short introduction and instructions, the Master Gardeners distributed an instrument and pencil to the participant. The instruments were returned to the Master Gardeners when completed.

Due to the sensitivity of human research, Texas A&M University Institutional Review Board (IRB) approval was required to start the survey process. IRB approval was requested for the instrument (2004-0385) and granted on July 9, 2004.

Selection of Respondents

The target population for this study were people attending two garden seminars sponsored by Extension and Fort Worth Water Department. The content of the seminars was not related to the material for the study. The seminar topics were Perennials, Container Gardening, and Herbs. These seminars are regularly offered by Extension and the Fort Worth Water Department. The seminars were advertised through Extension newsletter, inserts in horticulture factsheet mailings from the Extension office, inserts in water bills, newspaper, and television. Participants were asked to remain after the seminars for about 30 minutes to participate. Of the 111 attendees to the first landscape seminar, 95 elected to participate. Of the 92 attendees to the second seminar, 73 elected to participate. As noted earlier, a limitation of this study was that generalizing the findings beyond the target population is tenuous. Given the experimental research design, some broader generalizations may exist.

Instrumentation

The research instrument (Appendix D) consisted of a four-part questionnaire, which was designed based on the review literature (Boone, 1995; Campbell & Stanley, 1963; Grow, 1991; Knowles, 1998; Rogers, 2003; Rockwell & Kohn, 1989). Part I of the

research instrument was designed to measure the participants' knowledge of landscape management practices after participating in one of the five treatments. Part II of the research instrument was designed to measure learning preferences of participants. Learning preferences included newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and garden show, video, garden seminar, Web, books, friend, magazine, and neighbor. Part III of the research instruments was designed to measure the participants' perceived expertise before and after the treatment. The posttest-only control group design was used for Part III (Campbell and Stanley, 1963). The post-then-pre design was used to eliminate inaccurate assessment by participants of their knowledge before and after the treatment, (Rockwell & Kohn, 1989). The participants were asked to rate their knowledge after the treatment then rate their knowledge before the treatment. From Rockwell's report on post-then-pre evaluation, evaluation training, and experience, I have used the post-then-pre evaluation method and found the results to be more accurate after visiting with participants. When participants are asked to rate their knowledge before a program, they have no baseline to measure their pre-knowledge. After the program, many participants realize they may have report their pre-knowledge inaccurately now that they realize how much more they learned from the program. I have witnessed this often with landscape professionals and nurserymen. When I administered a standard pre-test/post-test evaluation and asked about knowledge before and knowledge after, the participants would always rate their knowledge high before the program. After the program, I would hear from the participants that they learned a great deal yet the statistics did not reflect this fact. When

I changed to the post-then-pre evaluation method, the statistics more accurately reflected what I was hearing from the participants. Part IV of the research instrument was designed to collect personal characteristics. Characteristics of adopter categories were used as a theoretical base for Part IV (Rogers, 2003). Gender was measured as either female or male. The level of measurement for gender was nominal. Age was measured as the number of years since birth. The level of measurement for age was ratio. Ethnicity was as White (Non-Hispanic), Black/African-American, Hispanic, Native American, Asian, and other. The level of measurement for ethnicity was nominal. Education was measured as less than high school, high school degree, some college, Bachelor's degree, Master's degree, and Doctoral degree. The level of education for education was nominal. Income was measured as \$25,000 or less, \$25,001 to 45,000, \$45,001 to 65,000, \$65,001 to 75,000, and 75,001 or higher. The level of measurement of income was ratio. Home ownership was own home, rent home, and rent apartment. Level of measurement for home ownership was nominal. Landscape irrigation practices was measured as no irrigation, hand held sprinkler, hose-end yard sprinkler, and irrigation system. Level of measurement for irrigation practices was nominal. Landscape maintenance practices were I maintain my own landscape, I hire landscape maintenance 1 or 2 times a year, I hire landscape maintenance 4 or 5 times a year, and I hire landscape maintenance weekly during the mowing season. Level of measurement for landscape maintenance was nominal.

Validity and Reliability

The instrument was pilot tested with 11 county Extension agents from Tarrant County, Texas. This group was not part of the sample population. The instruments were distributed to the county Extension agents participating after a regular scheduled office conference. Eight (72.7%) instruments were returned with complete responses. Using this pilot data, reliability for the participants' knowledge of landscape management practices section was estimated at $r=.73$, by calculating a Cronbach's alpha coefficient. Given the low number of respondents in the pilot study, additional evidence of reliability were estimated by calculating Cronbach's alpha coefficient of the final sample, $r=.60$. Recommendations for increasing instrument reliability are provided in the next chapter.

Content and face validity of the instrument were established by a panel of experts consisting of faculty and professionals who have expertise in the field. Minor wording and ordering of the instrument were made based on the recommendations of the panel of experts.

Data Collection

Data were collected from questionnaire administered to participants at two Extension garden seminars. The participants included 95 attendees to the first landscape seminar, August 28, 2004, and 73 attendees of the second garden seminar, September 2, 2004. Participants were asked to remain after the garden seminars for one of five treatments and then fill out the questionnaire. Participants were assured that their responses were confidential and only group data would be reported. The questionnaire

was printed in five different colors. Each color represented one treatment. A total response rate of 83% ($n=168$) was obtained. Of the completed surveys returned, nine were incomplete, resulting in a usable response rate of 78% ($n=159$) for the study.

Data Analysis

The collected data were analyzed using the Statistical Package for Social Sciences (SPSS, 11.0). Alpha for all statistical procedures was set at .05, a priori.

Objective One

The first objective was to describe Extension clients by selected personal characteristics. The variable of Extension clients by selected personal characteristics (gender, ethnicity, age, education, income, home ownership, irrigation practices, landscape manage practices) was analyzed and described by calculating frequencies and percentages by level of response.

Objective Two

The second objective was to describe Extension clients by their perceptions of learning preferences for mass media related to landscape maintenance. The variable of preferred method of receiving information (newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and garden show, video, garden seminar, Web, books, friend, magazine, and neighbor) was analyzed and described by calculating frequencies and percentages by level of response. The variable of primary method for receiving information (newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and garden show, video, garden seminar,

Web, books, friend, magazine, and neighbor) was analyzed and described by calculating frequencies and percentages by level of response. The variable of number of times the client received information from Extension was analyzed and described by calculating frequencies and percentages by level of response.

Objective Three

The third objective was to describe the Extension clients by their perceived level of landscape maintenance expertise (best management practices) before and after information session. The variable of perceived level of landscape maintenance expertise (best management practices) was analyzed and described by calculating frequencies and percentages mean, and standard deviation by level of response after the information session. The variable of perceived level of landscape maintenance expertise (best management practices) was analyzed and described by calculating frequencies, percentages, mean, and standard deviation by level of response before the information session.

Objective Four

The fourth objective was to describe the Extension clients according to their knowledge about landscape maintenance. The variable of knowledge about landscape maintenance was analyzed and described by calculating frequencies and percentages by level of response.

Objective Five

The fifth objective was to examine the relationship between Extension clients' knowledge about landscape maintenance score and mass media format (seminar,

factsheet, newspaper article, video, control). The variable relationship between Extension clients' knowledge about landscape maintenance score and mass media format (seminar, factsheet, newspaper article, video, control) was analyzed and described by calculating mean, standard deviation, and analysis of variance by level of response. To assess the magnitude of statistical differences, effect sizes were calculated, interpreted, and report (Cohen, 1988). Interpretations for ANOVA were based on the Cohen convention: negligible size, $f < 0.10$; small effect size, $0.25 > f \geq 0.10$; medium effect size, $0.40 > f \geq 0.25$; and large effect size, $f \geq 0.40$. Cohen (1988) noted that small effect sizes are not readily observable, medium effect sizes are readily observable, and large effect sizes are evident.

Objective Six

The sixth objective was to examine the relationship between Extension clients' knowledge about landscape maintenance score and selected personal characteristics; gender, education, income, and irrigation method. The variable relationship between Extension clients' knowledge about landscape maintenance score and selected personal characteristics (gender, education, income, and irrigation method) were analyzed and described by calculating mean, standard deviation, and analysis of variance by level of response.

To assess the magnitude of statistical differences, effect sizes were calculated, interpreted, and reported (Cohen, 1988). Interpretations for t-tests were based on the Cohen convention: negligible size, $d < 0.20$; small effect size, $0.50 > d \geq 0.20$; medium effect size, $.080 > d \geq 0.50$; and large effect size, $d \geq 0.80$. Interpretations for ANOVA

were based on the Cohen convention: negligible size, $f < 0.10$; small effect size, $0.10 < f < 0.25$; medium effect size, $0.25 < f < 0.40$; and large effect size, $f \geq 0.40$. Cohen (1988) noted that small effect sizes are not readily observable, medium effect sizes are readily observable, and large effect sizes are evident.

Objective Seven

The seventh objective was to examine the relationship between Extension clients' knowledge about landscape maintenance score and perceptions on learning preference; most preferred methods and primary method (newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and garden show, video, garden seminar, Web, books, friend, magazine, and neighbor), and number of times received information from Extension. The variable relationship between Extension clients' knowledge about landscape maintenance score and perceptions on learning preference and primary (newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and garden show, video, garden seminar, Web, books, friend, magazine, and neighbor), and number of times received information from Extension was analyzed and described by calculating mean, standard deviation, and analysis of variance by level of response.

To assess the magnitude of statistical differences, effect sizes were calculated, interpreted, and report (Cohen, 1988). Interpretations for ANOVA were based on the Cohen convention: negligible size, $f < 0.10$; small effect size, $0.10 < f < 0.25$; medium effect size, $0.25 < f < 0.40$; and large effect size, $f \geq 0.40$. Cohen (1988) noted that small

effect sizes are not readily observable, medium effect sizes are readily observable, and large effect sizes are evident.

Objective Eight

The eighth objective was to examine the relationship between Extension clients' knowledge about landscape maintenance score and perceived level of landscape maintenance expertise (before and after treatment). The variable relationship between Extension clients' knowledge about landscape maintenance score and perceived level of landscape maintenance expertise (before and after treatment) was analyzed and described by calculating mean, standard deviation, Pearson correlation, paired t-test and paired sample test.

Data Analysis

Measures of association were indicated by Pearson's Product-Moment coefficient of correlation. This method is appropriate when the variables to be correlated are normally distributed and measured on the interval or ratio scale (Ary, Jacobs, & Razavich, 1996). The magnitude of the relationships was interpreted using Davis' convention for association (Davis, 1971): 0.70 or higher = Very Strong Association; 0.50 to 0.69 = Substantial Association; 0.30 to 0.49 = Moderate Association; 0.10 to 0.29 = Low Association; and 0.01 to 0.09 = Negligible Association.

CHAPTER IV

FINDINGS

This chapter represents the findings of the study by objective. The purpose of this study was to explore the perceptions of Tarrant County, Texas Cooperative Extension clients with respect to their learning preferences for mass media related to landscape maintenance and to describe the effects of various mass media on clientele's short-term cognitive development.

Population Response

The target population for this study were people attending two Extension sponsored garden seminars. According to the North Central Texas Council of Government there are 425,744 homeowners with landscapes in Tarrant County, Texas (NCTCOG, 2004). The attendees ($n=203$) to two garden seminars sponsored by Texas Cooperative Extension and the City of Fort Worth Water Department were the sample population for this study. Table 1 shows the total sample population, 203. Seminar one was held August 28, 2004 with 111 people in attendance. Of the 111 attendees, 95 elected to participate. There were 4 unusable questionnaires. Seminar two was held September 28, 2004 with 92 in attendance. Of the 92 attendees to the second seminar, 73 elected to participate. There were 5 unusable questionnaires. A total of 168 questionnaires were returned, 159 were complete.

Table 1
Response Population to Questionnaire

| Groups | <i>f</i> | % |
|-------------------------|----------|-------|
| Seminar 1 | | |
| Respondents, complete | 91 | 82.0 |
| Respondents, incomplete | 4 | 3.6 |
| Non-respondents | 16 | 14.4 |
| Total | 111 | 100.0 |
| Seminar 2 | | |
| Respondents, complete | 68 | 74.0 |
| Respondents, incomplete | 5 | 5.4 |
| Non-respondents | 19 | 20.6 |
| Total | 92 | 100.0 |

Findings Related to Objective One

Objective one was to describe Extension clients in this study by selected personal characteristics. Frequencies and percentages were used to describe the results. The variables include gender, ethnicity, age, education, income, home ownership, irrigation practices, and landscape manage practices

Gender

Table 2 shows distribution of participating Extension clients ($n=159$) by gender, 134 (84.3%) Extension clients were female and 25 (15.7) were male.

Table 2
Gender of Participants

| Gender | <i>f</i> | % |
|--------|----------|-------|
| Female | 134 | 84.3 |
| Male | 25 | 15.7 |
| Total | 159 | 100.0 |

Age

Table 3 shows dispersal of Extension clients ($n = 159$) participating in this study by age. Eight Extension clients (5.0%) were in the 19 to 35 years old range; 10 (6.3%) were in the 36 to 45 years old range; 43 (27%) were in the 46 to 55 years old age range; 50 (31.4%) were in the 56 to 65 years old age range; 41 (25.8%) were in the 66 to 75 years old age range; and 7 (4.4%) were 76 years old or older. The largest age group represented was the 56 to 65 years old range.

Table 3
Age of Participants

| Age | <i>f</i> | % |
|-------------|----------|-------|
| 18-35 | 8 | 05.0 |
| 36-45 | 10 | 06.3 |
| 46-55 | 43 | 27.0 |
| 56-65 | 50 | 31.4 |
| 66-75 | 41 | 25.8 |
| 76 or older | 7 | 04.4 |
| Total | 159 | 100.0 |

Ethnicity

Table 4 shows the distribution of the Extension clients ($n = 159$) participating in this study by ethnicity. One hundred and forty-seven clients (94.2) were white (Non-Hispanic); 4 (2.6%) were Hispanic; 2 (1.3%) were Black/African American; 2 (1.3%) were other; 1 (.6 %) were Asian; and no Native Americans participated. Three clients chose not to respond to this question.

Table 4
Ethnicity of Participants

| Ethnicity | <i>f</i> | % |
|------------------------|----------|-------|
| White (Non-Hispanic) | 147 | 94.2 |
| Hispanic | 4 | 2.6 |
| Black/African American | 2 | 1.3 |
| Other | 2 | 1.3 |
| Asian | 1 | 0.6 |
| Native American | 0 | 0.0 |
| Total | 156 | 100.0 |

Notes: 3 clients chose not to respond to this question.

Education

Table 5 shows the distribution of the Extension clients ($n=159$) participating in this study by education. Seven (4.5%) clients had a high school degree or less; 56 (36.1%) had some college; 49 (31.6%) had Bachelor's degrees; and 43 (27%) had graduate degrees. Four clients chose not to respond to this question.

Table 5
Education of Participants

| Education | <i>f</i> | % |
|----------------------|----------|-------|
| High School or Lower | 7 | 4.5 |
| Some College | 56 | 36.1 |
| Bachelor's Degree | 49 | 31.6 |
| Graduate Degrees | 43 | 27.0 |
| Total | 155 | 100.0 |

Note: 4 clients chose not to respond to this question.

Income

Table 6 shows the distribution of the Extension clients ($n=159$) participating in this study by income. Thirteen (8.8%) clients had income of \$25,000 or less; 36 (24.3%) were in the \$25,999 to \$45,000 income range; 32 (21.6%) were in the \$45,999 to \$65,000 income range; 20 (13.5%) were in the \$65,999 to \$75,000 income range; and 47 (31.8%) had income of \$75,999 or higher. Eleven clients chose not to respond to this question.

Table 6
Income of Participants

| Income | <i>f</i> | % |
|----------------------|----------|-------|
| \$25,000 or less | 13 | 08.8 |
| \$25,999 to \$45,000 | 36 | 24.3 |
| \$45,999 to \$65,000 | 32 | 21.6 |
| \$65,999 to \$75,000 | 20 | 13.5 |
| \$75,999 or higher | 47 | 31.8 |
| Total | 148 | 100.0 |

Note: 11 clients chose not to respond to this question.

Home Ownership

Table 7 shows the distribution of the Extension clients ($n=159$) participating in this study by home ownership. One hundred and fifty-four clients owned her/his home and one rented their home. Three clients chose not to respond to this question.

Table 7
Home Ownership

| Home Ownership | <i>f</i> | <i>%</i> |
|----------------|----------|----------|
| Own Home | 154 | 99.4 |
| Rent Home | 1 | 0.6 |
| Total | 155 | 110.0 |

Notes: 3 clients chose not to respond to this question.

Irrigation Methods

Table 8 shows the distribution of the Extension clients ($n=159$) participating in this study by irrigation method. Eighty-five (54.8%) clients had an irrigation system; 53 (34%) used hose-end sprinklers; 12 (7.7%) used hand held sprinklers; and 5 used no irrigation. Four clients chose not to respond to this question.

Table 8
Irrigation Method

| Irrigation Method | <i>f</i> | <i>%</i> |
|---------------------|----------|----------|
| Irrigation System | 85 | 54.8 |
| Hose-end Sprinkler | 53 | 34.2 |
| Hand Held Sprinkler | 12 | 7.7 |
| No Irrigation | 5 | 3.2 |
| Total | 155 | 100.0 |

Note: 4 clients chose not to respond to this question.

Landscape Maintenance Level

Table 9 shows the distribution of the Extension clients ($n=159$) participating in this study by landscape maintenance level. One hundred and thirty-one (84%) clients maintained their own landscape; 17 (10.9%) clients hire weekly maintenance; 4 (2.6%)

clients hire maintenance 1 or 2 times a year; and 4 (2.6%) clients hire landscape maintenance 3 to 4 times a year. Three clients chose not to respond to this question.

Table 9
Landscape Maintenance Level

| Maintenance Level | <i>f</i> | % |
|------------------------------------|----------|-------|
| Maintain own lawn | 131 | 84.0 |
| Hire weekly maintenance | 17 | 10.9 |
| Hire maintenance 1 or 2 times/year | 4 | 02.6 |
| Hire maintenance 3 or 4 times/year | 4 | 02.6 |
| Total | 156 | 100.0 |

Note: 3 clients chose not to respond to this question.

Findings Related to Objective Two

Objective two was to describe Extension clients by their perceptions of learning preferences for mass media related to landscape maintenance. Frequencies and percentages were used to describe the results. The variables were newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and Garden show, video, garden seminar, Web, books, friend, magazine, and neighbor.

Preferred Method for Receiving Information

Table 10 shows the client's preferred method for receiving landscape information. Thirty-nine (24.5%) clients preferred landscape information by factsheet; 28 (17.6%) clients preferred landscape information by garden seminar; 26 (16.4%) clients preferred landscape information by newspaper; 16 (10.1%) clients preferred

landscape information by Extension meeting; 12 (7.5%) clients preferred landscape information by books; 7 (4.4%) clients preferred landscape information by calling the Extension office; 7 (4.4%) clients preferred landscape information by magazines; 5 (3.1%) clients preferred landscape information by television; 5 (3.1%) clients preferred landscape information by video; 5 (3.1%) clients preferred landscape information by Web; 4 (2.5%) clients preferred landscape information by attending home and garden show; 3 (1.9%) clients preferred landscape information from a friend; and 2 (1.3%) clients preferred landscape information from neighbors.

Table 10
Preferred Method for Receiving Information

| Preferred Method for Receiving Information | <i>f</i> | % |
|--|----------|-------|
| Extension Factsheet | 39 | 24.5 |
| Garden Seminar | 28 | 17.6 |
| Newspaper | 26 | 16.4 |
| Extension Meeting | 16 | 10.1 |
| Books | 12 | 7.5 |
| Call to Extension office | 7 | 4.4 |
| Magazines | 7 | 4.4 |
| Television | 5 | 3.1 |
| Video | 5 | 3.1 |
| Web | 5 | 3.1 |
| Home and Garden Show | 4 | 2.5 |
| Friend | 3 | 1.9 |
| Neighbor | 2 | 1.3 |
| Total | 159 | 100.0 |

Primary Method for Receiving Information

Table 11 shows the clients' primary method for receiving landscape information. Thirty-one (19.5%) clients' primary method for receiving landscape information was

from newspapers; 24 (15.1%) clients' primary method for receiving landscape information was from Extension factsheets; 22 (13.8%) clients' primary method for receiving landscape information was from books; 20 (12.6%) clients' primary method for receiving landscape information was from Extension meetings; 18 (11.3%) clients' primary method for receiving landscape information was from garden seminars; 15 (9.4%) clients' primary method for receiving landscape information was from television; 7 (4.4%) clients' primary method for receiving landscape information was from magazines; 6 (3.8%) clients' primary method for receiving landscape information was from the Web; 5 (3.1%) clients' primary method for receiving landscape information was from calls to the Extension office; 5 (3.1%) clients' primary method for receiving landscape information was from friends; 3 (1.9%) clients' primary method for receiving landscape information was from home and garden shows; 3 (1.9%) clients' primary method for receiving landscape information was from neighbor; and 0 (0%) clients' primary method for receiving landscape information was from video.

Table 11
Primary Method for Receiving Information

| Primary Method for Receiving Information | <i>f</i> | % |
|--|----------|-------|
| Newspaper | 31 | 19.5 |
| Extension Factsheet | 24 | 15.1 |
| Books | 22 | 13.8 |
| Extension Meeting | 20 | 12.6 |
| Garden Seminar | 18 | 11.3 |
| Television | 15 | 9.4 |
| Magazines | 7 | 4.4 |
| Web | 6 | 3.8 |
| Call to Extension office | 5 | 3.1 |
| Friend | 5 | 3.1 |
| Home and Garden Show | 3 | 1.9 |
| Neighbor | 3 | 1.9 |
| Video | 0 | 0.0 |
| Total | 159 | 100.0 |

Number of Times Received Information From Extension

Table 12 the number of times clients received information from Extension. Seventy-three (45.9%) had received information from Extension 1 to 5 times; 40 (25.2%) had never received information from Extension; 25 (15.7%) had received information from Extension 6 to 10 times; 13 (8.2%) had received information from Extension 15 times or more; and 8 (5 %) had received information from Extension 11 to 15 times.

Table 12
Number of Times Received Information From Extension

| Number of Times Received Information From Extension | <i>f</i> | % |
|---|----------|------|
| Never | 40 | 25.2 |
| 1-5 Times | 73 | 45.9 |
| 6-10 times | 25 | 15.7 |
| 11-15 times | 8 | 05.0 |
| 15 or more times | 13 | 08.2 |
| Total | 159 | |

Findings Related to Objective Three

Objective three was to describe Extension clients by their perceived level of landscape maintenance expertise. Frequencies and percentages were used to describe the results. The perceived level of landscape knowledge was measured by four statements “I can effectively manage runoff,” “I prevent irrigation water waste,” “I can determine how long to run irrigation,” “I know the benefits of native plants,” and “I know how to determine water requirements.” The perceived before and after level of landscape knowledge or expertise was measured after the information session.

Perceived Level of Landscape Maintenance Expertise After the Information Session

Table 13 shows the clients perceived level of landscape maintenance expertise, after the information session: when asked if they could effectively manage runoff 1 (0.8%) disagreed; 54 (41.9%) agreed; and 74 (57.4%) strongly agreed. When asked if they could prevent irrigation water waste 3 (2.3%) disagreed; 39 (30%) agreed; and 88 (67.7%) strongly agreed. When asked if they could determine how long to run irrigation

1 (0.8%) strongly disagreed; 39 (30%) agreed; and 90 (56.6) strongly agreed. When asked if they know about the benefits of native plants 1 (0.8%) disagreed; 26 (20%) agreed; and 103 (64.8) strongly agreed. When asked if they knew how to determine water requirements 3 (2.3%) disagreed; 50 (31.4%) agreed; and 77 (59.2%) strongly agreed.

Table 13
Perceived Level of Landscape Maintenance Expertise After the Information Session

| <i>Statement</i> | Strongly Disagree | | Disagree | | Agree | | Strongly Agree | |
|--|-------------------|----------|----------|----------|----------|----------|----------------|----------|
| | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> |
| I prevent irrigation water waste | 0 | 0.0 | 3 | 2.3 | 39 | 30.0 | 88 | 67.7 |
| I know the benefits of native plants | 0 | 0.0 | 1 | 0.8 | 26 | 20.0 | 103 | 64.8 |
| I know how to determine water requirements | 0 | 0.0 | 3 | 2.3 | 50 | 31.4 | 77 | 59.2 |
| I can effectively manage runoff | 0 | 0.0 | 1 | 0.8 | 54 | 41.9 | 74 | 57.4 |
| I can determine how long to run irrigation | 1 | 00.8 | 0 | 0.0 | 39 | 30.0 | 90 | 56.6 |

Note: Scale, 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree; A mean before score was calculated by summing item responses: Q24a $M=3.57$, $SD=0.51$; Q25a $M=3.65$, $SD=0.52$; Q26a $M=3.68$, $SD=0.51$; Q27a $M=3.78$, $SD=0.431$; Q27a $M=.57$, $SD=0.54$

Perceived Level of Landscape Maintenance Expertise Before the Information Session

Table 14 shows the clients perceived level of landscape maintenance expertise, before the information session: when asked if they could effectively manage runoff 2 (1.5%); strongly disagreed; 31 (22.6%) disagreed; 77 (56.2%) agreed; and 27 (19.7%) strongly agreed. When asked if they could prevent irrigation water waste 3 (2.3%) strongly disagreed; 26 (19%) disagreed; 75 (54.7%) agreed; and 33 (24.1%) strongly agreed. When asked they could determine how long to run irrigation 8 (5.8%) strongly disagreed; 38 (27.7%) disagreed; 70 (51.1%) agreed; and 21 (15.3%) strongly agreed. When asked if they know about the benefits of native plants 4 (2.9%) strongly disagreed; 21 (15.4) disagreed; 66 (48.5%) agreed; and 45 (33.1%) strongly agreed. When asked if they knew how to determine water requirements 6 (4.4%) strongly disagreed; 40 (29.2%) disagreed; 75 (54.7) agreed; and 16 (11.7%) strongly agreed.

Table 14
Perceived Level of Landscape Maintenance Expertise Before the Information Session

| <i>Statement</i> | Strongly Disagree | | Disagree | | Agree | | Strongly Agree | |
|--|-------------------|----------|----------|----------|----------|----------|----------------|----------|
| | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> |
| I know the benefits of native plants | 4 | 2.9 | 21 | 15.4 | 66 | 48.5 | 45 | 33.1 |
| I prevent irrigation water waste | 3 | 2.3 | 26 | 19.0 | 75 | 54.7 | 33 | 24.1 |
| I can effectively manage runoff | 2 | 1.5 | 31 | 22.6 | 77 | 56.2 | 27 | 19.7 |
| I can determine how long to run irrigation | 8 | 5.8 | 38 | 27.7 | 70 | 51.1 | 21 | 15.3 |
| I know how to determine water requirements | 6 | 4.4 | 40 | 29.2 | 75 | 54.7 | 16 | 11.7 |

Note: Scale, 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree; A mean before score was calculated by summing item responses: Q24b $M=2.94$, $SD=0.69$; Q25b $M=3.01$, $SD=0.72$; Q26b $M=2.76$, $SD=0.78$; Q27b $M=3.12$, $SD=0.77$; Q28b $M=2.74$, $SD=0.72$

Findings Related to Objective Four

Objective four was to describe Extension clients ($n=159$) according to their knowledge about landscape maintenance by their score from 20 questions.

Table 15 shows the number of clients ($n=159$) and their score about landscape maintenance. A score of 6 was made by only 1 (0.6%) client. A score of 7 was only made by 1 (0.6%) client. A score 8 was made by 3 (1.9%) clients. A score of 9 was made by 3 (1.9%) clients. A score of 10 was made by 5 (3.1%) clients. A score of 11 was made by 6 (3.8%) clients. A score of 12 was made by 13 (8.2%) clients. A score of 13 was made by 20 (12.6%) clients. A score of 14 was made by 17 (10.7%) clients. A score

of 15 was made by 22 (13.8%) clients. A score of 16 was made by 28 (17.6%) clients. A score of 17 was made by 20 (12.6%) clients. A score of 18 was made by 14 (8.8%) clients. A score of 19 was made by 6 (3.8%) clients. The mean score was $m=14.57$. The standard deviation was $SD=2.68$.

Table 15
Extension Clients' Score According to Their Knowledge About Landscape Maintenance

| <i>Score</i> | <i>f</i> | <i>%</i> |
|--------------|----------|----------|
| 6 | 1 | .6 |
| 7 | 1 | .6 |
| 8 | 3 | 1.9 |
| 9 | 3 | 1.9 |
| 10 | 5 | 3.1 |
| 11 | 6 | 3.8 |
| 12 | 13 | 8.2 |
| 13 | 20 | 12.6 |
| 14 | 17 | 10.7 |
| 15 | 22 | 13.8 |
| 16 | 28 | 17.6 |
| 17 | 20 | 12.6 |
| 18 | 14 | 8.8 |
| 19 | 6 | 3.8 |
| Total | 159 | 100.0 |

Note: $M^a=14.57$, $SD=2.68$;
score, number of correct
answers of a possible of 20 after
receiving treatment.

Findings Related to Objective Five

Objective five was to determine the relationship between Extension clients' knowledge about landscape score and treatment (seminar, factsheet, newspaper article, video, control).

Table 16 shows knowledge about landscape maintenance by score and treatment (seminar, factsheet, newspaper article, video, control). Out of a possible score of 20, the control group ($n=27$) mean score was 12.41. Out of a possible score of 20, the newspaper group ($n=31$) mean score was 15.71. Out of a possible score of 20, the Factsheet group ($n=40$) mean score was 14.98. Out of a possible score of 20, the video group ($n=34$) mean score was 15.32. Out of a possible score of 20, the face-to-face group ($n=27$) mean score was 13.93.

A statistically significant difference in knowledge about landscape score was found by treatment level, $F(4, 154) = 8.40, p < .05$. A Scheffe post hoc analysis of the data shows that participants who received the treatments newspaper, factsheet, and video scored higher than the control group on the knowledge about landscape maintenance test. A large effect size ($f = .47$) was found.

Table 16
Difference in Knowledge About Landscape Maintenance Score by Treatment (n=159)

| Treatment | <i>n</i> | <i>M^a</i> | <i>SD</i> | <i>F</i> | <i>p</i> |
|---------------|----------|----------------------|-----------|----------|----------|
| Newspaper | 31 | 15.71 | 1.81 | | |
| Video | 34 | 15.32 | 2.29 | | |
| Factsheet | 40 | 14.98 | 2.99 | | |
| Face-to-face | 27 | 13.93 | 2.92 | | |
| Control Group | 27 | 12.41 | 1.87 | 8.40 | 0.0* |

Note: $M^a=14.58, SD=2.68$; score, number of correct answers of a possible of 20 after receiving treatment or control

Findings Related to Objective Six

Objective six was to examine the relationship between Extension clients' knowledge about landscape maintenance score and selected personal characteristics.

Score as Related to Gender

Table 17 shows the relationship between Extension clients' knowledge about landscape maintenance score and gender. Female clients' ($n=134$) mean score was 14.46. Male clients' ($n=25$) mean score was 15.24. No statistically significant differences were found between gender and knowledge about landscape score, $t(157)=0.18, p>.05$. A negligible effect size ($d=.13$) was found.

Table 17
Score as Related to Gender (n=159)

| Gender | <i>n</i> | <i>M^a</i> | <i>SD</i> | <i>t</i> |
|--------|----------|----------------------|-----------|----------|
| Female | 134 | 14.46 | 2.73 | 0.18 |
| Male | 25 | 15.24 | 2.37 | |

Note: $M^a=14.58, SD=2.68, df=157$; score, number of correct answers of a possible of 20 after receiving treatment or control.

Score as Related to Age (n=159)

Table 18 shows the relationship between Extension clients' knowledge about landscape maintenance score and age. The 18 to 35 years old age group's ($n=8$) mean score was 15.38. The 36 to 45 years old age group's ($n=10$) mean score was 14.90. The 46 to 55 years old age group's ($n=43$) mean score was 14.95. The 56 to 65 years old age group's ($n=50$) mean score was 14.90. The 66 to 75 years old age group's ($n=41$) mean score was 14.20. The 75 years old and older age group's ($n=7$) mean score was 10.86. A

statistically significant difference in knowledge about landscape score was found by age, $F(5, 153) = 3.62, P < .05$. A Scheffe post hoc analysis showed that those participants 76 years old or older had lower scores than any of the other participants. A medium effect size ($f = .34$) was found.

Table 18
Score as Related to Age (n=159)

| Age | <i>n</i> | <i>M^a</i> | <i>SD</i> | <i>F</i> | <i>p</i> |
|-------------|----------|----------------------|-----------|----------|----------|
| 18-35 | 8 | 15.38 | 1.60 | 3.62 | 0.0* |
| 36-45 | 10 | 14.90 | 1.85 | | |
| 46-55 | 43 | 14.95 | 2.74 | | |
| 56-65 | 50 | 14.90 | 2.37 | | |
| 66-75 | 41 | 14.20 | 2.82 | | |
| 76 or older | 7 | 10.86 | 3.13 | | |

Note: $M^a = 14.58, SD = 2.68, df = 5, 153$; score, number of correct answers of a possible of 20 after receiving treatment or control.

Score as Related to Education

Table 19 shows the relationship between Extension clients' knowledge about landscape maintenance score and their education. The high school or lower group's ($n=7$) mean score was 13.29. The some college group's ($n=56$) mean score was 14.18. The Bachelor's degree group's ($n=49$) mean score was 15.00. The graduate degree group's ($n=43$) mean score was 14.90. No statistically significant differences were found between education and knowledge about landscape score, $F(3, 151) = 1.65, p > .05$. A small effect size ($f = .16$) was found.

Table 19
Score as Related to Education (n=159)

| Education | <i>n</i> | <i>M^a</i> | <i>SD</i> | <i>F</i> | <i>p</i> |
|----------------------|----------|----------------------|-----------|----------|----------|
| High School or Lower | 7 | 13.29 | 3.15 | 1.65 | .18 |
| Some College | 56 | 14.18 | 2.84 | | |
| Bachelor's Degree | 49 | 15.00 | 2.27 | | |
| Graduate Degrees | 43 | 14.93 | 2.69 | | |

Note: $M^a=14.58$, $SD=2.68$, $df=3, 151$; score, number of correct answers of a possible of 20 after receiving treatment or control.

Score as Related to Income

Table 20 shows the relationship between Extension clients' knowledge about landscape maintenance score and income. The \$25,000 or less income group's ($n=13$) mean score was 13.92. The \$25,999 to \$45,000 income group's ($n=36$) mean score was 14.56. The \$45,999 to \$65,000 income group's ($n=32$) mean score was 14.47. The \$65,999 to \$75,000 income group's ($n=20$) mean score was 14.30. The \$75,999 or higher income group's ($n=47$) mean score was 14.91. No statistically significant differences were found between income and knowledge about landscape score, $F(4, 143) = .44$, $p > .05$. A small effect size ($f = .11$) was found.

Table 20
Score as Related to Income (n=159)

| Income | <i>n</i> | <i>M</i> ^a | <i>SD</i> | <i>F</i> | <i>p</i> |
|----------------------|----------|-----------------------|-----------|----------|----------|
| \$25,000 or less | 13 | 13.92 | 2.75 | 0.44 | .78 |
| \$25,999 to \$45,000 | 36 | 14.56 | 2.32 | | |
| \$45,999 to \$65,000 | 32 | 14.47 | 2.77 | | |
| \$65,999 to \$75,000 | 20 | 14.30 | 2.98 | | |
| \$75,999 or higher | 47 | 14.91 | 2.79 | | |

Note: *M*^a=14.58, *SD*=2.68, *df*=4, 143; score, number of correct answers of a possible of 20 after receiving treatment or control.

Score as Related to Irrigation Method

Table 21 shows the relationship between Extension clients' knowledge about landscape maintenance score and their irrigation method. The Extension clients with an irrigation system (*n*=85) mean score was 14.88. The Extension clients that use hose-end sprinkler irrigation (*n*=53) mean score was 13.92. The Extension clients that use hand held irrigation (*n*=12) mean score was 15.58. The Extension clients with no irrigation (*n*=5) mean score was 14.80. No statistically significant differences were found between irrigation method and knowledge about landscape score, $F(3, 151) = 2.05, p > .05$. A small effect size ($f = .19$) was found.

Table 21
Score as Related to Irrigation Method (n=159)

| Irrigation Method | <i>n</i> | <i>M^a</i> | <i>SD</i> | <i>F</i> | <i>p</i> |
|---------------------|----------|----------------------|-----------|----------|----------|
| Irrigation System | 85 | 14.88 | 2.57 | 2.05 | .11 |
| Hose-end Sprinkler | 53 | 13.92 | 2.87 | | |
| Hand Held Sprinkler | 12 | 15.58 | 2.02 | | |
| No Irrigation | 5 | 14.80 | 2.39 | | |

Note: $M^a=14.58$, $SD=2.68$, $df=3, 151$; score, number of correct answers of a possible of 20 after receiving treatment or control.

Findings Related to Objective Seven

Objective seven was to examine the relationship between Extension clients' knowledge about landscape maintenance score and perceptions on learning preference.

Table 22 shows the relationship between Extension clients' knowledge about landscape maintenance score and perceptions on learning preference. The 84 Extension clients who preferred print media (newspaper, Extension factsheet, book, and magazine) scored 14.65. The 60 Extension clients who preferred face-to-face (Extension meeting, garden seminar, call to Extension office, friend, home and garden show, and neighbor) scored 14.52. The 15 Extension clients who preferred electronic media (television, Web, video) scored 14.40. No statistically significant differences were found between clients' most preferred method for receiving landscape maintenance information and knowledge about landscape score, $F(2, 156) = .08, p > .05$. A negligible effect size ($f = .03$) was found.

Table 22
Extension Clients' Most Preferred Method for Receiving Landscape Maintenance Information (n=159)

| Types of Media (recoded from before) | <i>n</i> | <i>M^a</i> | <i>SD</i> | <i>F</i> | <i>p</i> |
|--------------------------------------|----------|----------------------|-----------|----------|----------|
| Print | 84 | 14.65 | 2.73 | .08 | .92 |
| Face-to-face | 60 | 14.52 | 2.68 | | |
| Electronic | 15 | 14.40 | 2.59 | | |

Note: $M^a=14.58$, $SD=2.68$, $df=2$, 156; score, number of correct answers of a possible of 20 after receiving treatment or control.

Table 23 shows the relationship between Extension clients' knowledge about landscape maintenance score and perceptions on learning preference. The 84 Extension clients who said their primary source was print media (newspaper, Extension factsheet, book, and magazine) scored 14.87. The 54 Extension clients who said their primary source was face-to-face (Extension meeting, garden seminar, call to Extension office, friend, home and garden show, and neighbor) scored 14.44. The 15 Extension clients who said their primary source was electronic media (television, Web, video) scored 13.76. No statistically significant differences were found between education and knowledge about landscape score, $F(2, 156) = 1.54$, $p > .05$. A small effect size ($f = .14$) was found. A small effect size ($f = .14$) was found.

Table 23
Extension Clients' Most Primary Method for Receiving Landscape Maintenance Information (n=159)

| Types of Media (recoded from before) | <i>n</i> | <i>M^a</i> | <i>SD</i> | <i>F</i> | <i>p</i> |
|--------------------------------------|----------|----------------------|-----------|----------|----------|
| Print | 84 | 14.87 | 2.52 | 1.54 | .22 |
| Face-to-face | 54 | 14.44 | 2.57 | | |
| Electronic | 21 | 13.76 | 3.45 | | |

Note: $M^a=14.58$, $SD=2.68$, $df=2$, 156; score, number of correct answers of a possible of 20 after receiving treatment or control.

Number of Times Client Received Information From Extension

Table 24 shows the relationship between Extension clients' knowledge about landscape maintenance score and the number of times a client received information from Extension. The 73 clients who received information from Extension 1 to 5 times mean score was 14.49. The 40 clients who never received information from Extension mean score was 14.00. The 25 clients who received information from Extension 6 to 10 times mean score was 15.36. The 13 clients who received information from Extension 15 or more times mean score was 14.46. The 8 clients who received information from Extension 11 to 15 times mean score was 16.00. No statistically significant differences were found between number of times client received information from Extension and knowledge about landscape score, $F(4, 154) = 1.61$, $p > .05$. A small effect size ($f = .20$) was found.

Table 24
Number of Times Client Received Information From Extension

| Number of Times Received Information From Extension | <i>n</i> | <i>M</i> ^a | <i>SD</i> | <i>F</i> | <i>p</i> |
|---|----------|-----------------------|-----------|----------|----------|
| Never | 40 | 14.00 | 2.98 | 1.61 | .18 |
| 1-5 Times | 73 | 14.49 | 2.66 | | |
| 6-10 times | 25 | 15.36 | 2.55 | | |
| 11-15 times | 8 | 16.00 | 2.20 | | |
| 15 or more times | 13 | 14.46 | 1.98 | | |

Note: *M*^a=14.58, *SD*=2.68, *df*=4, 154; score, number of correct answers of a possible of 20 after receiving treatment or control.

Findings Related to Objective Eight

Objective eight was to examine the relationship between Extension clients' knowledge about landscape maintenance score and perceived level of landscape maintenance expertise.

A landscape maintenance expertise score was computed by summing participant's responses to five statements (see Table 25). A gain score was computed by subtracting the after score from the before score. A statistically significant and positive low association was found between the knowledge about landscape maintenance score and after expertise score, $r=25, p=2.05$, 2nd before expertise score, $r=.23, p=2.05$. A negative negligible association was found between knowledge score and gain score, $r = -.02, p > .05$.

Table 25
Landscape Expertise Before and After Gain

| Expertise | <i>N</i> | <i>M</i> | <i>SD</i> |
|-----------|----------|----------|-----------|
| After | 130 | 18.22 | 1.91 |
| Before | 137 | 14.54 | 2.97 |
| Gain | 130 | 3.50 | 2.83 |

Note: Scale=0.70 or higher= Very Strong Association; 0.50 to 0.69= Substantial Association; 0.30 to 0.49= Moderate Association; 0.10 to 0.29= Low Association; 0.01 to 0.09= Negligible Association; Mean knowledge about Landscape Maintenance Score=14.58

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The objectives of the study, summary of methodology, and summary of findings, conclusions, and implications, and recommendations are presented in this chapter. The purpose of this study were to explore the perceptions of Tarrant County, Texas Cooperative Extension clients with respect to their learning preferences for mass media related to landscape maintenance and to describe the effects of various mass media on clientele's short-term cognitive development.

Objectives of the Study

There were eight specific objectives addressed in the conduct of this study:

1. Describe Extension clients by selected personal characteristics.
2. Describe Extension clients by their perceptions on learning preferences for mass media related to landscape maintenance.
3. Describe Extension clients by their perceived level of landscape maintenance expertise.
4. Describe Extension clients according to their knowledge about landscape maintenance score.
5. Examine the relationship between Extension clients' knowledge about landscape maintenance score and mass media format (seminar, factsheet, newspaper article, video, control).

6. Examine the relationship between Extension clients' knowledge about landscape maintenance score and selected personal characteristics.
7. Examine the relationship between Extension clients' knowledge about landscape maintenance score and perceptions on learning preference.
8. Examine the relationship between Extension clients' knowledge about landscape maintenance score and perceived level of landscape maintenance expertise.

Summary of Methodology

The research design used for this study was descriptive and correlational in nature. The study was designed to explore the perceptions of Tarrant County, Texas Cooperative Extension clients with respect to their learning preferences for mass media related to landscape maintenance and to describe the effects of various mass media on clientele's short-term cognitive development. The theoretical framework for this was based on: The theoretical framework for this study was based on; (1) Rogers' (2003) model of the innovation-decision process, (2) Rogers' (2003) characteristics of adopter categories, (3) Knowles' (1998) six core adult learning principles, and Grow's (1991) stages in learning autonomy.

The target population for this study were people attending two Extension sponsored landscape seminars. The seminars were advertised through Extension newsletter, inserts in horticulture factsheet mailings from the Extension office, inserts in water bills, newspaper, and television. Participants were asked to remain after the seminars for about 30 minutes to participate. Of the 111 attendees to the first landscape

seminar, 95 elected to participate. Of the 92 attendees to the second seminar, 73 elected to participate.

The research instrument (Appendix D) consisted of a four-part questionnaire, which was designed based on the review literature (Rogers' 2003; Knowles' 1998; Grow, 1991). Part I of the research instrument was designed to measure the participants' knowledge of landscape management practices after participating in one of the five treatments. Part II of the research instrument was designed to measure learning preferences of participants. Learning preferences included newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and Garden show, video, garden seminar, Web, books, friend, magazine, and neighbor. Part III of the research instruments was designed to measure the participants' perceived expertise of the participants before and after the treatment. The posttest-only control group design was used for Part III (Campbell and Stanley, 1963). Part IV of the research instrument was designed to collection personal characteristics. Characteristics of adopter categories were used as a theoretical base for Part IV (Rogers, 2003).

Using the pilot data, reliability for the participants' knowledge of landscape management practices section was estimated at $r=.73$, by calculating a Cronbach's alpha coefficient. Given the low number of respondents in the pilot study, additional evidence of reliability were estimated by calculating Cronbach's alpha coefficient of the final sample, $r=.60$.

Content and face validity of the instrument were established by a panel of experts consisting of faculty and professionals who have expertise in the field. Minor wording

and ordering of the instrument were made based on the recommendations of the panel of experts.

Data were collected from questionnaire administered to participants at two Extension landscape seminars. The participants included 95 attendees to the first landscape seminar, August 28, 2004, and 73 attendees of the second landscape seminar, September 2, 2004.

The collected data were analyzed using the Statistical Package for Social Sciences (SPSS, 11.0). Alpha for all statistical procedures was set at .05 a priori.

Summary of Key Findings and Conclusions for Each Objective

Objective One

The first objective was to describe Extension clients by selected personal characteristics. Variable include gender, ethnicity, age, education, income, home ownership, irrigation practices, and landscape manage practices.

Key Findings

Of the 159 participants, 134 (84.3%) Extension clients were female and 25 (15.7) were male. The largest age group represented was in the 56 to 65 years old range. One hundred and forty-seven (94.2%) clients were white. Of the 159 participants, 94.7% attended some college, had a Bachelor's or graduate degrees. One hundred and fifty-four (99.4%) clients owned their home. Eighty-five (54.8%) clients had an irrigation system. One hundred and thirty-one (84%) clients maintained their own landscape.

Conclusions

More than $\frac{3}{4}$ of the study population was female (84.3%). The largest group of the clients was above the age of 46 years old (88.6%). White was largest ethnic group (94.2%) represented. The clients were well educated. The largest income group was in the \$75,999 or higher income group (45.3%). All but 1 of the clients owned their own home. The majority of the clients (96.5%) irrigated their landscapes. The majority of the clients (84%) maintained their own landscape. Attending an Extension environmental seminar is like a commitment to learn and use the material (Rollins, et al., 1991). Since the majority of the clients attending these seminars were homeowners who cared for their own landscape, the material presented will most likely be adopted.

Implications

According to Rogers' (2003) generalizations about characteristic of adopter categories, early adopters have higher social status than later adopters. A major part of the Extension clients (45.3%) in this study group were in the \$65,999 or higher income group. All but one (99.4%) in the study group owned their own home. Ninety-two (58.6%) in the study group had a college degree or higher. These characteristics (education, income, and homeownership) of the study group place the study group in the higher social status group, which suggest they would be early adopters, (Rogers, 2003). According to Rogers' (2003) generalizations about characteristics of adopter categories, age is not a factor in early adoption/late adoption. The Extension clients attending the landscape seminars were middle age or older. The ethnicity of the Extension clients was not diverse. One hundred and forty-seven (94.2%) in the study group were white. The

majority of the study group irrigated their landscape, 55% with automatic irrigation systems and 65% by a garden hose method. As for landscape maintenance, 84% maintained their own landscape. These factors (irrigation method and landscape maintenance practices) show the commitment from the study group for the desire to learn landscape best management practices.

The study group was more homologous than diverse. The study group did not reflect the demographics of the county (white 62.8%; Hispanic 19.7%; black or African American 13.1%; Asian 3.5%; and .9 % other). The demographics of the newspaper readers and television viewers are more diverse than the Extension audience.

Recommendations

Further studies are recommended to identify why Extension audiences in an urban area do not reflect the diversity of the county population by age, gender, ethnicity, income, education, and homeownership.

Objective Two

Objective two was to describe Extension clients by their perceptions of learning preferences for mass media related to landscape maintenance. Frequencies and percentages were used to describe the results. The variables were newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and Garden show, video, garden seminar, Web, books, friend, magazine, and neighbor.

Key Findings

When asked what their preferred method (newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and Garden show, video, garden

seminar, Web, books, friend, magazine, and neighbor) for receiving landscape maintenance information, 24.5% in the study group ($n=159$) preferred landscape information by factsheet; 17.6% preferred landscape information by garden seminar; 16.4% clients preferred landscape information by newspaper; 10.1% preferred landscape information by Extension meeting; 7.5% preferred landscape information by books; 4.4% preferred landscape information by calling the Extension office; 4.4% preferred landscape information by magazines; 3.1% preferred landscape information by television; 3.1% preferred landscape information by video; 3.1% preferred landscape information by Web; 2.5% preferred landscape information by attending home and garden show; 1.9% preferred landscape information from a friend; and 1.3% preferred landscape information from neighbors.

When asked what their primary method (newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and Garden show, video, garden seminar, Web, books, friend, magazine, and neighbor) for receiving landscape information, the study group ($n=159$) indicated 19.5% of clients' primary method for receiving landscape information was from newspapers; 15.1% clients' primary method for receiving landscape information was from Extension factsheets; 13.8% clients' primary method for receiving landscape information was from books; 12.6% clients' primary method for receiving landscape information was from Extension meetings; 11.3% clients' primary method for receiving landscape information was from garden seminars; 9.4% clients' primary method for receiving landscape information was from television; 4.4% clients' primary method for receiving landscape information was from

magazines; 3.8% clients' primary method for receiving landscape information was from the Web; 3.1% clients' primary method for receiving landscape information was from calls to the Extension office; 3.1% clients' primary method for receiving landscape information was from friends; 1.9% clients' primary method for receiving landscape information was from home and garden shows; 1.9% clients' primary method for receiving landscape information was from neighbor; and 0% clients' primary method for receiving landscape information was from video.

Conclusions

Of the study group ($n=159$), 52.2% said they preferred print media (newspaper, Extension factsheet, books, magazines) for landscape information and 70.4% said their primary source for landscape information was print media (newspaper, Extension factsheet, books, magazines). Of the study group, 37.8% said they preferred face-to-face methods (garden seminar, Extension meeting, call to Extension office, Home and Garden Show, friend, and neighbor) for receiving landscape information and 33.9% said their primary method for receiving landscape information was face-to-face methods (garden seminar, Extension meeting, call to Extension office, Home and Garden Show, friend, and neighbor). Of the study group 9.3% said they preferred electronic methods (television, video, and Web) for receiving landscape information and 3.1% said their primary method for receiving landscape information was electronic (television, video, and Web).

Implications

For the study population ($n=159$), print media was the most preferred (Extension factsheet 24.5%; newspaper 16.4%; books 7.5%; and magazines 4.4%) and primary (newspaper 19.5%; Extension factsheet 15.1%; books 13.8; and magazines 4.4%) source for landscape maintenance information. The face-to-face methods were the second most preferred (garden seminar 17.6%; Extension meeting 10.1%; call to Extension office 4.4%; Home and Garden Show 2.5%; friend 1.9%; and neighbor 1.3%) and primary (Extension meeting 12.6%; garden seminar 11.3%; call to Extension office 3.1%; friend 3.1%; Home and Garden Show 1.9%; and neighbor 1.9%) methods for receiving landscape maintenance information. Electronic media was the least preferred (television 3.1%; video 3.1% and Web 3.1%) and least primary (television 9.4%; video 0.0% and Web 3.8%) method for receiving landscape maintenance information.

Conclusions

Most research shows Extension audiences prefer face-to-face/interpersonal interaction with Extension (Blacklock, 1985; Bouare and Bowen, 1990a; Bouare and Bowen, 1990b; Richardson, Clement, and Mustian's, 1997; Riesenbergs and Gor, 1989; Rollins, Bruening, and Radhakrishna, 1991; Warner and Christenson, 1984). The results of this study differ from the past research about Extension audiences and how they prefer to receive information. The audience in this study preferred to receive landscape maintenance information by print media. The audience in this study said their primary source for landscape information is print media.

Recommendations

Further research is needed to study the following: (1) How many agents in Texas have a regular contact with a mass media resource; (2) Do county Extension agents have the necessary skills, knowledge, technologies, and time to sustain a regular relationship with mass media resources (Martin, Stewart, & Hillison, 2001; Seevers al et., 1997; Scherer & Masielat, 1988); (3) How many county Extension agents have a regular newspaper column, television program, and radio broadcast; (4) How many people in the Texas are reached by Extension information through regular mass media sources; (5) How many people in Texas only contact with Extension is through mass media; and (6) How can Extension evaluate the impact of mass media on the audience?

Objective Three

The third objective was to describe the Extension clients by their perceived level of landscape maintenance expertise (best management practices) before and after the information session.

Key Findings

The Extension clients in the study group ($n=159$) were asked what their perceived level of landscape maintenance expertise was after and before the information session. After the information session, clients were asked if they could effectively manage runoff, 99.3% agreed or strongly agreed. When asked if they could prevent irrigation water waste, 97.7% agreed or strongly agreed. When asked if they could determine how long to run irrigation, 86.6% agreed or strongly agreed. When asked if they know about the benefits of native plants, 84.8% agreed or strongly agreed. When

asked if they knew how to determine water requirements, 90.6% agreed or strongly agreed.

When asked what their perceived level of landscape maintenance expertise was before the information session: 78.8% agreed or strongly agreed they could effectively manage runoff. When asked if they could prevent irrigation water waste, 78.8%. When asked they could determine how long to run irrigation, 66.4% agreed or strongly agreed. When asked if they know about the benefits of native 81.6% agreed or strongly agreed. When asked if they knew how to determine water requirements, 66.4 % agreed or strongly agreed.

Conclusions

The study population showed an over all gain in knowledge about landscape maintenance after the information session. When asked if they could prevent irrigation water waste 99.3% agreed or strongly agreed after the information session whereas 75.9% agreed or strongly agreed before the information session. This reflects a 23.4% gain in knowledge. When asked if they could prevent irrigation water waste 97.7% agreed or strongly agreed after the information session and 78.8% agreed or strongly agreed. This reflects an 18.9% gain in knowledge. When asked if they could determine how long to run irrigation 86.6% agreed or strongly agreed after the information session and 66.4% agreed or strongly agreed before the information session. This reflects a 20.2% gain in knowledge. When asked if they know about the benefits of native plants, 84.8% agreed or strongly agreed after the information session and 81.6% agreed or strongly agreed before the information session. This reflects a 3.2% gain in knowledge.

When asked if they knew how to determine water requirements, 90.6% agreed or strongly agreed after the information session and 66.4 % agreed or strongly agreed before the information session. This reflects a 24.2% gain in knowledge.

Implications

The education delivery methods (newspaper, factsheet, television, face-to-face) used in this study provided clients with a gain in knowledge of landscape information. As urban county agents plan their program delivery, multiple delivery methods providing the same information could reach a larger more diverse audience. Mass media resources reach a larger more diverse audience than Extension normally has attend their educational programs (Seevers al et.,1995. Homeowners are like any other adult learners, once they identify their need to learn, adults will look for the education depending on their self-concept, past learning experiences, readiness to learn, orientation to learning, and motivation (Knowles, al et., 1998). According to Seevers (1995) most county extension agents have not been trained to teach adults. According to Boone (1995) Extension is the largest adult education agency in the world.

Recommendations

Further research is needed to study the following: (1) Do Texas county Extension agents and specialists know the principles of adult learning (Garton, Spain, Lamberson & Spiers, 1999; Seevers, 1995); (2) Is adult education training available to Texas county extension agents and specialists; (3) Do Texas county Extension agents and specialists know how to plan their education delivery based on adult learning principles; and (4)

Are county Extension agents aware of the many delivery methods available to reach large urban audiences, (Radhakrishna & Thomson, 1996; Russell, 1995; Simeral, 2001).

Objective Four

The fourth objective was to describe the Extension clients according to their knowledge about landscape maintenance.

Key Findings

The mean score was $n=14.57$ for the 20 questions about landscape maintenance best management practices. The standard deviation was $SD=2.68$. A score of 13 was made by 20 (12.6%) clients. A score of 14 was made by 17 (10.7%) clients. A score of 15 was made by 22 (13.8%) clients. A score of 16 was made by 28 (17.6%) clients. A score of 17 was made by 20 (12.6%) clients. A score of 18 was made by 14 (8.8%) clients. A score of 19 was made by 6 (3.8%) clients.

Conclusions

The majority, 56.6%, reached a cognitive level enough to answer the questionnaire/test questions about landscape maintenance with a score of 75 or better. These scores cannot be totally attributed to the education sessions attended. The past experience and knowledge of the participants was not measured. Since attendance to the environmental landscape seminars were totally voluntary and participation in the research study was voluntary, the participants are more likely to adopt the best management practices to prevent landscape irrigation water runoff by watering properly (Rollins, et al. 1991).

Implications

All the treatment groups (newspaper, video/television, factsheet, and face-to-face presentation) in this study showed a gain in knowledge over the control group. This shows multiple delivery methods can teach the same information. If mass media can actually teach those needing/willing to learn, Extension could use mass media to provide education to a larger more diverse audience than the traditional Extension audience. Since learners have different capacities to learn and are at different learning stages (Grow, 1991; Knowles, et al. 1998), by using multiple educational delivery methods through mass media, Extension can reach more people.

Recommendations

If print media is the preferred and primary resource where homeowners receive garden/landscape information in an urban county and if newspaper and television can teach best management practices, I recommend Extension support county agents training, time, resources, and technologies to create sustainable relationships with print and television media. Most mass media resources think highly of the information received from university professionals (Vestal and Briers, 2000). Further research is needed to study the following: do County Extension agents have the technology skills to write newspaper articles and create television segments, (Martin, Stewart, and Hillison, 2001)?

Objective Five

The fifth objective was to examine the relationship between Extension clients' knowledge about landscape maintenance score and mass media format (seminar, factsheet, newspaper article, video, control).

Key Findings

The study population's knowledge about landscape maintenance by score and treatment or control (seminar, factsheet, newspaper article, video, control) was out of a possible score of 20, the newspaper group ($n=31$) mean score was 15.71; the video group ($n=34$) mean score was 15.32; the Factsheet group ($n=40$) mean score was 14.98; the face-to-face group ($n=27$) mean score was 13.93; and the control group ($n=27$) mean score was 12.41

Conclusions

The mean score of the newspaper group and the video group were the highest. The newspaper article was an actual regularly appearing weekly newspaper column (Woodson, 2004). The video was a tape of a daily scheduled television program on community cable access channel (Woodson, 2004). The mean score ($M=15.71$) of the newspaper group was the highest. The mean score ($M=15.32$) for the video group was the second highest. The mean score ($M=14.98$) for the factsheet group was third highest. The mean score ($M=13.93$) for the face-to-face was fourth out of five. The mean score ($M=12.41$) for the control group was fifth out of five.

Implications

In this study, the mean scores for newspaper, video/television, factsheet, and presentation treatments were higher than the mean score of the control group, indicating learning did occur. Past research indicated factsheets/Extension bulletins and face-to-face/interpersonal communication methods have historically been the preferred method for receiving information from Extension (Martin and Omar, 1990; Gamon, Roe, Campbell, 1994; Richard and Mustian, 1994). This study indicated an urban Extension audience attending an Extension sponsored garden seminar, learned more from the newspaper, video of the television show, and the Extension factsheet than from the face-to-face presentation.

The most surprising finding of this study was the participants in face-to-face treatment group did not score much higher than the control group. Past research indicated face-to-face presentations are one of the most preferred delivery method by most Extension audiences (Martin and Omar, 1990; Gamon, Roe, Campbell, 1994; Richard and Mustian, 1994). The variable for this study and all presentations was the presenter. A presentation success is very dependent on the presenter's knowledge, methods, and personality. A presentation is impacted by preparation, organization, and presentation skills. This presentation could have been influenced by the presenter not feeling well, distracted, stressed, tired, telling stories instead of facts, or just not be a good presenter. Since the county Extension agent asked to do this presentation was provided with a copy of the factsheet, newspaper, video, and questionnaire by the researcher, and the presenter had a good reputation there is not a good explanation of why this occurred. The researcher was not present during the presentation.

According to Grow (1991), Seevers (1995), Knowles (1998), Rogers (2003) targeting an audience with information they need or think they need, will be a successful teaching/learning experience. Extension must use many different delivery methods to reach the target audience (Martin and Omar, 1990; Gamon, Roe, Campbell, 1994; Richard and Mustian, 1994). In a rural county where the county Extension agent can ask everyone a target audience to attend a seminar and have them all come, a presentation and factsheet will meet the needs of the county Extension agent and audience, (Kerrigan, 1993). In an urban county where the target audience is so large, the audience could not even fit into a lecture hall, county Extension agents must use mass media delivery methods to reach a larger number of their target audience.

All the methods of education delivery in this study were successful teaching delivery methods. The study population in all treatment groups showed a gain in knowledge above the control group. Even though the newspaper and video/television treatment scores were higher, I do not think newspaper articles and television should or could ever replace Extension seminars or fact sheets. I do think this study indicates Extension can reach an audience using mass media to teach best management practices.

Recommendations

I recommend urban county Extension agents create a relationship with media resources. I recommend urban county Extension agents treat mass media as a teaching delivery method.

Further studies are recommended in these areas: (1) competencies of Extension agents in all the education delivery methods (Cooper, 2001; Extension Committee, 1992,

Fett, 1992); and (2) urban Extension agents' perceptions of what is the best delivery method in urban counties.

Objective Six

The sixth objective was to examine the relationship between Extension clients' knowledge about landscape maintenance score and selected personal characteristics; gender, education, income, and irrigation method.

Key Findings

This study shows the relationship between Extension clients' knowledge about landscape maintenance score and gender. Female clients' ($n=134$) mean score was 14.46. Male clients' ($n=25$) mean score was 15.24.

There was not much difference in the relationship between Extension clients' knowledge about landscape maintenance score and age.

There was not much difference in the relationship between Extension clients' knowledge about landscape maintenance score and their education.

There was not much difference in the relationship between Extension clients' knowledge about landscape maintenance score and their irrigation method.

Conclusions

Gender, age, education, income, and irrigation method did not have a great influence on the study group's knowledge about landscape maintenance score.

Implications

According to Rogers' (2003) generalizations about characteristic of adopter categories, early adopters enjoy a higher social status than later adopters. Income and

education are indicators of higher social status. The results of this study are no different than the results of similar studies Grow (1991), Seevers (1995), Knowles (1998), Rogers (2003).

Recommendations

Further studies are recommended to follow a study group to see if they actually changed or adapted a landscape maintenance practice that they said they learned at a garden seminar, from a newspaper article, from a factsheet, or from the television show. From the personal feedback I have received, I know that many readers and viewers are adopting best management practices in my newspaper articles and on the television shows.

Objective Seven

The seventh objective was to examine the relationship between Extension clients' knowledge about landscape maintenance score and perceptions on learning preference; most preferred methods and primary method (newspaper, Extension factsheet, call to Extension office, television, Extension meeting, home and garden show, video, garden seminar, Web, books, friend, magazine, and neighbor), and number of times received information from Extension.

Key Findings

Forty (25%) of the study group had never received information from Extension. One hundred and nineteen (75%) of the study group had received information from Extension. The mean score of the group that had never received information from

Extension was 14.00. All other groups by number of times they received information from Extension in this study scored higher, 1 to 5 times 14.49; 5 to 10 times 15.36; 11 to 15 times 16.00.

There was not a great difference in the relationship between Extension clients' knowledge about landscape maintenance score and perceptions on learning preference. There was no great difference in the relationship between Extension clients' knowledge about landscape maintenance score and their primary source for information. All groups by number of times they received information from Extension in this study scored higher than the group that had never received information from Extension.

Conclusions

The participants' perceptions of their primary and preferred learning preference did not appear to have a great influence on their knowledge about landscape maintenance score. The number of times the participants had received information from Extension did appear to influence their knowledge about landscape maintenance score but not enough to discount their knowledge gain from the treatments.

Implications

Multiple contacts with Extension did influence the short-term cognitive development of the participants in this study. County Extension agents have always used multiple methods to reach clients, (Seevers, 1995; Martin and Omar, 1990; Gamon, Roe, Campbell, 1994; Richard and Mustian, 1994). This study reinforces past research on the effectiveness of multiple delivery methods.

Recommendations

Agents should use multiple teaching delivery methods to reach and teach best management practices. Extension should provide training for multiple teaching delivery methods. Further study is recommended to see what different teaching delivery methods are being used by urban Texas county Extension agents.

Objective Eight

The eighth objective was to examine the relationship between Extension clients' knowledge about landscape maintenance score and perceived level of landscape maintenance expertise (before and after treatment).

Key Findings

A statistically significant and positive low association was found between the knowledge about landscape maintenance score and after expertise score, $r=.25, p<.05$, 2nd before expertise score, $r=.23, p<.05$. A negative negligible association was found between knowledge score and gain score, $r=-.02, p>.05$.

Conclusions

Participants with higher expertise scores after their treatment, tended to have higher knowledge scores. Participants with higher expertise scores before their treatment, tended to have higher knowledge scores. Participants gain scores did not differ by knowledge scores.

Implications

An implication exists that participants' perceptions about their level of expertise is prediction of their actual knowledge. Given the low association between perceived level of expertise and actual knowledge, caution is warranted against using perception scales to measure expertise in landscape maintenance. An implication exists that participants' increased perceptions of gain in expertise are not predictive of actual gains in knowledge.

Recommendations

It is recommended that when attempting to measure knowledge and expertise of homeowners' knowledge about landscape maintenance that tests of cognitive development be used.

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APPENDIX A
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS IN RESEARCH
APPROVAL LETTER



JUL 23 RE

Date July 9, 2004

MEMORANDUM

Office of Research Compliance

Administration and Special Programs

Academy for Advanced Telecommunication and Learning Technologies

Institute for Scientific Collaboration

Laboratory Animal Resources and Research

Manuscript and Image Center

Office of Business Administration

Office of Graduate Studies

Office of Sponsored Programs

Office of Student Services

TO: Ms. Dorothy Woodson
Dept. of Agricultural Education
MS 2116

FROM: Dr. E. Murl Bailey, CIP, Advisor
Institutional Review Board
MS 1112

SUBJECT: IRB Protocol Review

Title: Mass Media as an Extension Delivery Method in an Urban County

Protocol Number: 2004-0385
Review Category: Exempt from Full Review
Approval Date: July 9, 2004 to July 8, 2005

The approval determination was based on the following Code of Federal Regulations
<http://ohrp.osophs.dhhs.gov/humansubjects/guidance/45cfr46.htm>

- | | |
|--|---------------------------------------|
| <input type="checkbox"/> 46.101(b)(1) | <input type="checkbox"/> 46.101(b)(4) |
| <input checked="" type="checkbox"/> 46.101(b)(2) | <input type="checkbox"/> 46.101(b)(5) |
| <input type="checkbox"/> 46.101(b)(3) | <input type="checkbox"/> 46.101(b)(6) |

Remarks:

After specific review, it has been determined that approval for waiver of the requirement to obtain signed informed consent may be granted under 45 CFR 46.117(c). However, a study information sheet must be provided to study participants. Approval includes waiver of risk and benefit statement in the information sheet.



TEXAS A&M
UNIVERSITY

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FAX 979.862.3176

The Institutional Review Board – Human Subjects in Research, Texas A&M University has reviewed and approved the above referenced protocol. Your study has been approved for one year. As the principal investigator of this study, you assume the following responsibilities:

Renewal: Your protocol must be re-approved each year in order to continue the research. You must also complete the proper renewal forms in order to continue the study after the initial approval period.

Adverse events: Any adverse events or reactions must be reported to the IRB immediately.

Amendments: Any changes to the protocol, such as procedures, consent/assent forms, addition of subjects, or study design must be reported to and approved by the IRB.

Informed Consent/Assent: All subjects should be given a copy of the consent document approved by the IRB for use in your study.

Completion: When the study is complete, you must notify the IRB office and complete the required forms.

Dear Homeowner,

Thank you for participating in this survey about Irrigation and Landscape practices. I appreciate your time and attention.

The following questionnaire is designed to explore different methods Texas Cooperative Extension uses to provide homeowners with landscape maintenance information.

The questionnaire is divided into four parts. Please, read the directions for each part before responding. All individual responses are confidential. No individual information about the respondent will be published or disclosed. Your responses will be combined with that of others and reported as grouped data.

The information is being gathered and analyzed as part of the researcher's requirements for completing her doctoral degree.

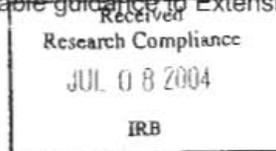
This survey will take approximately 10 to 15 minutes to complete.

This survey has been reviewed and approved by the Institutional Review Board for Human Subjects in Research, Texas A&M University. Questions about this survey or the research project may be directed to the Institutional Review Board: Dr. Michael Buckley, Director of Support Services, Office of Vice President for Research at 979-458-4067.

Questions may also be directed to the researcher, Dotty Woodson (telephone 817-884-1944, email d-woodson@tamu.edu).

Thank you for taking time to complete this research survey. Your ideas and opinions will provide valuable guidance to Extension, and we appreciate your help.

Thank You,



Dotty Woodson
Horticulture County Extension Agent
Texas Cooperative Extension
Texas A&M University System
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APPENDIX B
NEWSPAPER ARTICLE

LIVING



Diggin' with Dotty

By Dotty Woodson, Horticulturist, Tx Cooperative Extension

Water quality and conservation - a checklist for homeowners

Rainfall was plentiful in June and filled up North Texas lakes. Even so, we're already begun to hear about cities asking homeowners to limit watering their lawns to every five days. Some municipalities are even issuing fines for homeowners who don't comply. "Why are these restrictions necessary?" you may ask. The answer is twofold. Water quality and water conservation are issues that effect each and every one of us.

Water quality is an issue because all the drinking water in our area comes from the lakes in and around Tarrant County. Research shows that runoff from home landscapes carries fertilizer, pesticides and soil into storm drains and, eventually, into the lakes. Runoff occurs when water is applied faster than the ground can absorb it. As the water quality in our lakes deteriorates because of runoff, the cost to clean the water rises.... And, our water bills increase.

Water conservation is becoming more critical because of the huge population growth in North Texas. As more homes and businesses are built, there's an ever-increasing demand for water to keep landscapes green and beautiful.

Water conservation is not a new issue. For many years we've read and heard about the importance of water conservation in our homes. We have an entire generation that's grown up with low water use appliances such as showers, toilets, dishwashers and washing machines. Now, however, we need to focus our attention on conserving water when tending our landscapes.

There's nothing more frustrating than reading about an issue and feeling there is little you can do as an individual to help solve the problem. That's not the case with landscape water. Your individual efforts in watering your landscape efficiently, and applying fertilizers and pesticides properly can make a difference!

Here's a simple checklist of things you can do:

- Plant native and adapted

plants. They don't require as much water, pesticides and fertilizer.

- Use irrigation water as efficiently as possible.
- Apply pesticides only when necessary.
- Fertilize according to a soil test.
- Mulch all shrubs, flower and vegetables gardens.

Plant Selection

For a list, pictures and descriptions of native and adapted plants, visit <http://www.tx-smartscape.com>, or send a self-address stamped envelop with your request to Extension Horticulture, 401 E. 8th St. Fort Worth, TX 76102. The Texas SmartScape web site also includes landscape design and maintenance instructions.

Watering

Research shows lawns will survive and stay green when watered every five to seven days during the summer and every 15 to 20 days during the winter. Plant roots are opportunistic.... they grow where there's water. Infrequent deep watering makes plants grow deep roots. Shallow, frequent watering creates short roots, under six inches long. As water evaporates from the soil surface, short rooted plants need more water. However, plants with roots six inches or longer, still have water available to absorb from the deeper soil.

The average lawn requires one inch of water on clay soil and one and a half inches on sandy soil.

Audit your watering method to find out how long it must run to apply the correct amount of water, make sure no runoff occurs, all water is applied to the ground and the water pattern covers the area.

It's easy to audit sprinklers by running them with tuna or cat food cans spread across the lawn to collect water. Time how long the sprinkler must run to fill the cans with one inch of water. While the system is running, check to make sure all water is applied to the soil. If water is landing on a hard sur-

face, it's creating runoff. Turn the head so the water only lands on soil. If runoff occurs before you've applied one inch of water, adjust the timer on automatic sprinklers or decrease the water pressure at the faucet on hose fed sprinklers. Automatic sprinkler systems may also be adjusted by replacing the heads with low impact heads. If the water pattern is not correct, clean the sprinkler heads. If the pattern is still not right, replace the sprinkler head.

Pesticides

Apply pesticides only if necessary. After all, not all insects are bad! Check to make sure the insect you see is doing the damage before you apply a pesticide. Sometimes the insect doing the damage has already been consumed. You may actually be looking at the predator. If you need help identifying an insect, bring it to the Extension office for identification and recommendations.

Fertilizer

Fertilize according to a soil test. A soil test will tell you what plant nutrients are available and what amount and what formula of fertilizer to apply. Don't fertilize if rain is expected in the next 48 hours. If rain comes down too fast, the water-soluble fertilizer will end up in the lake and not benefit your landscape.

Mulch

Mulch is an important water conservation technique. Throughout the summer, maintain mulch to a depth of two to four inches under shrubs, flowers and in the garden. Mulch will help break the surface tension so water penetrates the soil faster, and also cuts down on water evaporation from the soil. Mulch will eventually decompose and become part of the soil, allowing the soil to hold more water.

If you have questions about this easy checklist of ways to help preserve the water quality and quantity in our area, call the Extension office at 817-884-1944.

APPENDIX C
FACTSHEET

How to Properly IRRIGATE AND WATER YOUR LANDSCAPE

by Dotty Woodson
Horticulture Agent
Tarrant County Extension



Water quality is an issue in Tarrant County because all the drinking water for North Central Texas comes from the lakes in and around Tarrant County. All the lakes are reservoirs built to collect and hold water to provide Tarrant County with drinking water. The water providers in this area clean the water insuring that we have safe, clean drinking water.

Research of the lake water, and lake water sources, shows runoff from home and landscapes carry fertilizer, pesticide and soil into the storm drains unfiltered. This causes water quality problems, as well as negatively effects local wildlife near lakes and stream.

The water quality is an issue because this unfiltered water, known as runoff, runs into the lakes. As the quality of the water in the lakes deteriorates, the cost to clean the water increases, causing are water bills to increase too.

Here are some quick tips on what you can do, to help prevent runoff:

- Plant native and adapted plants. These plants do not require as much water or as much pesticides and fertilizers.
- Use irrigation water as efficiently as possible. Only water when necessary and make sure all the water lands on the soil.
- Only apply pesticides when necessary.

THE BASICS OF LAWN CARE

Proper watering is the primary key to having a luscious lawn. Avoiding runoff and assuring you have an efficient irrigation or watering system, will make all the difference. By following these tips you will have a healthy lawn, help conserve water and maybe even reduce your water bill.

AUDIT YOUR IRRIGATION

Every sprinkler method applies water at different rates. Audit your watering method to find out how long your method must run to apply the correct amount of water. Make sure no runoff occurs, all the water is applied to the ground and the water pattern covers the area.

Audit your irrigation equipment to check how much water you are applying. The average lawn requires 1 inch of water on clay soil and 1.5 inches on sandy soil. Below are the steps to a simple test to see just how much you are watering:

- 1) Run the sprinkler with tuna or cat food cans on the lawn, within the watering pattern, to collect water.
- 2) Time how long the sprinkler must run to fill up the cans with 1 inch of water.

After you have determined how long you need to run your sprinkler, you can help conserve water and reduce runoff.

ADJUSTING YOUR SPRINKLERS

If runoff occurs before you have applied one inch of water, you need to adjust the sprinkler.

Adjust hose-end sprinklers by decreasing the water pressure at the water faucet. Sprinkler systems are adjusted by replacing the heads with low impact heads. This can be done by you or you can call an irrigation repairman.

If the water pattern is not correct, clean the sprinkler heads. If the pattern is still bad, replace the sprinkler head. Also, if water is landing on a hard surface, turn the sprinkler head at an angle where water lands only on the soil.

Check your sprinkler and sprinkler heads periodically to save time and money.



HOW OFTEN YOU NEED TO WATER

The irrigation audit will identify how long you need to run the sprinkler, but how often is the next question.

Infrequent, deep watering make plants grow deeper roots. Plant roots are opportunistic and grow where there is water. Deep-rooted plants, 6 inch or longer roots, are able to absorb water in the soil at deeper levels. This is great for the often dry weather, sometimes drought, we have in Texas.

Shallow frequent watering creates short roots, under 6 inches long. As water evaporates from the soil surface, short rooted plants need more water.

For lawn areas, try to stay on a five-day watering cycle during the summer. In the winter stay on a 15 to 20 day cycle. The length of the watering cycle will depend on your type of grass, soil and time of year. This is why it is important for you to know how to adjust the sprinkler controller.

CORRECTLY APPLY PESTICIDES

Only apply pesticides if necessary. Check to make sure the insect you see is doing the damage before you apply a pesticide, because not all insects are bad. If you need help identifying an insect, please bring it to the Extension office. We will identify the insect and make a recommendation.

If you do need to apply a pesticide, always thoroughly read the label and carefully follow directions for application.

APPLYING FERTILIZER

Make sure to fertilizer according to a soil test.

Do not fertilize if rain is expected within 48 hours. If rain comes down too fast or you irrigation creates runoff, all the water-soluble fertilizer will end up in the local lakes. This causes water quality issues, as well as costs you more time and money to apply more fertilizer.

MULCH, MULCH, MULCH

Mulch is an important water conservation technique. Add mulch throughout the summer. Mulch will help break the surface tension so water will penetrate the soil faster. It will also cut down on water evaporating from the soil.

Mulch will eventually decompose and become part of the soil, allowing the soil to hold more water. Use 2 to 4 inches of mulch under shrubs, flowers and in the garden. Add more mulch as it breaks down.

ZONE YOUR LANDSCAPE

Flowers, shrubs and vegetable gardens require different watering schedules from a lawn. Zone your sprinkler system for flowers, shrubs and a vegetable garden.

Drip irrigation applies water at a slow rate and places the water right where the water is required. There is very little waste with a drip system. Most hardware warehouses and some garden centers carry easy to install drip irrigation systems.

FOR MORE INFORMATION

For more information about irrigation audits or best management practices for your lawn, garden or landscape, contact:

Dotty Woodson 817.884.1944
 Extension Agent - Horticulture
 Tarrant County Extension
 401 E. 8th Street
 Fort Worth, Texas 76102
 dl-woodson@tamu.edu

Also visit these web site for more info about what plants and grasses are best for Texas:

Texas Smart Scape www.txsmartscape.com
 Texas A&M Horticulture aggie-horticulture.tamu.edu
 Texas Superstars www.texassuperstar.com



Educational programs of Texas Cooperative Extension are open to all people without regard to race, color, sex, disability, religion, age, or national origin. The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners Courts of Texas Cooperating



APPENDIX D
INSTRUMENT

LANDSCAPE PRACTICES



A survey to help **Texas Cooperative Extension** understand the best delivery method for Extension information about irrigation and landscape practices in a large urban county. **Texas Cooperative Extension's** mission is to provide quality, relevant outreach and continuing education programs and services to the people of Texas. **Texas Cooperative Extension** is a member of the **Agriculture Program** of **The Texas A&M University System**.

A Questionnaire

Dear Homeowner,

Thank you for participating in this survey about Irrigation and Landscape practices. I appreciate your time and attention.

The following questionnaire is designed to explore different methods Texas Cooperative Extension uses to provide homeowners with landscape maintenance information.

The questionnaire is divided into four parts. Please, read the directions for each part before responding. All individual responses are confidential. No individual information about the respondent will be published or disclosed. Your responses will be combined with that of others and reported as grouped data.

The information is being gathered and analyzed as part of the researcher's requirements for completing her doctoral degree.

This survey will take approximately 10 to 15 minutes to complete.

This survey has been reviewed and approved by the Institutional Review Board for Human Subjects in Research, Texas A&M University. Questions about this survey or the research project may be directed to the Institutional Review Board: Dr. Michael Buckley, Director of Support Services, Office of Vice President for Research at 979-458-4067.

Questions may also be directed to the researcher, Dotty Woodson (telephone 817-884-1944, email d-woodson@tamu.edu).

Thank you for taking time to complete this research survey. Your ideas and opinions will provide valuable guidance to Extension, and we appreciate your help.

Thank You,

Dotty Woodson
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Extension Education Methods Instrument**Section I Knowledge about landscape maintenance**

Please select the best answer by placing a check in the box next to the answer.

1. Runoff occurs
 - Every time it rains
 - Every time an irrigation system runs
 - When water hits the ground faster than the ground can absorb it
 - All of the above
2. Water contamination from home landscapes occurs by runoff carrying
 - Soil particles into the storm drain
 - Fertilizer into the storm drain
 - Pesticides into the storm drain
 - All of the above
3. Storm water off home landscapes enters the storm drain and then flows through streams and rivers into lakes
 - Biologically filtered
 - Filtered
 - Unfiltered
 - All of the above
4. Auditing your irrigation method tells you
 - How often to irrigate
 - How much water is required in the landscape
 - How long to run the irrigation
 - All of the above
5. A sprinkler runs properly when
 - Water is distributed evenly over the area the sprinkler was designed to cover
 - The sprinkler turns on when the landscape needs water
 - The sprinkler turns off when enough water is applied
 - All of the above
6. Native and adapted plants
 - Use fewer pesticides
 - Use less fertilizer
 - Use less water
 - All of the above
7. The frequency of irrigation is effected by
 - Plant selection
 - Time of year
 - Temperature
 - All of the above

Continues on next page →

8. The root zone for water and fertilizer absorption is typically
- 4 to 6 inches deep
 - 7 to 10 inches deep
 - 11 to 14 inches deep
 - All of the above
9. Mulch is **most** important because it
- Looks good in the landscape
 - Reduces evaporation of water from the root zone
 - Is easy to apply
 - All of the above
10. Infrequent deep watering methods
- Stress lawns
 - Encourage deep roots to grow
 - May damage root structure
 - All of the above
11. During the summer, water clay soil by applying
- 1/2 inch of water
 - 1 inch of water
 - 1 1/2 inches of water
 - 2 inches of water
12. During the summer, water sandy soil by applying
- 1/2 inch of water
 - 1 inch of water
 - 1 1/2 inches of water
 - 2 inches of water
13. In the heat of the summer, water the landscape every
- Every day
 - 2 to 4 days
 - 5 to 7 days
 - 8 to 10 days
14. In the winter, water a landscape about every
- 2 to 4 days
 - 5 to 7 days
 - 8 to 10 days
 - 15 to 20 days
15. _____ apply fertilizer and pesticides before rain is expected
- Always
 - Sometimes
 - Only in the summer
 - Never

Continues on next page →

16. The most common way water is wasted in the landscape is through

- Broken sprinkler heads
- Improper distribute of water by sprinkler
- Running a sprinkler system too long
- Dripping faucet

17. The best way to save money on your water bill is to

- Not water
- Water every other day
- Water only when plants show stress
- Water when plants need water

18. Landscaping with native and adapted plants save money because the plants

- Are native
- Inexpensive
- Require less water
- Increase the value of the landscape

19. The best time to water is between

- 8:00 P.M and 10:00 A.M.
- 8:00 A.M. and 10:00 P.M.
- 10:00 A.M. and 8:00 P.M.
- 10:00 P.M. and 8:00 A.M.

20. The most efficient method to irrigate shrub and flower beds is

- Water by hand held sprinkler
- Water with a hose-end sprinkler
- Automatic sprinkler system
- Drip irrigation

Section II Learning Preferences

Please, select the best answer by placing a check in the box next to the answer.

21. Which **one** of the following is your **most preferred** method to receive information about landscape maintenance?

- | | | | | |
|---|---|---|---------------------------------|------------------------------------|
| <input type="checkbox"/> Newspaper | <input type="checkbox"/> Television | <input type="checkbox"/> Video | <input type="checkbox"/> Books | <input type="checkbox"/> Magazines |
| <input type="checkbox"/> Extension fact sheet | <input type="checkbox"/> Extension meeting | <input type="checkbox"/> Garden seminar | <input type="checkbox"/> Friend | <input type="checkbox"/> Neighbor |
| <input type="checkbox"/> Call to the Extension office | <input type="checkbox"/> Home and Garden Show | <input type="checkbox"/> Web | | |

22. Which **one** of the following has been your **primary** method for receiving information about landscape maintenance?

- | | | | | |
|---|---|---|---------------------------------|------------------------------------|
| <input type="checkbox"/> Newspaper | <input type="checkbox"/> Television | <input type="checkbox"/> Video | <input type="checkbox"/> Books | <input type="checkbox"/> Magazines |
| <input type="checkbox"/> Extension fact sheet | <input type="checkbox"/> Extension meeting | <input type="checkbox"/> Garden seminar | <input type="checkbox"/> Friend | <input type="checkbox"/> Neighbor |
| <input type="checkbox"/> Call to the Extension office | <input type="checkbox"/> Home and Garden Show | <input type="checkbox"/> Web | | |

Continues on next page →

23. How many times have you received landscape information from Extension in the last 12 months?

- Never
 1-5 times
 6-10 times
 11-15
 15 or more

Section III After and Before

This section is designed to measure your perceived level of landscape maintenance expertise after and before *this* information session. Please read each statement carefully and indicate your perception *after* and *before* the information session. Circle the best response.

| After | | | | Statement | Before | | | |
|-------------------|----------|-------|----------------|---|-------------------|----------|-------|----------------|
| Strongly Disagree | Disagree | Agree | Strongly Agree | | Strongly Disagree | Disagree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | I can effectively manage runoff contamination on my property. | 1 | 2 | 3 | 4 |
| 1 | 2 | 3 | 4 | I can prevent water waste through irrigation maintenance. | 1 | 2 | 3 | 4 |
| 1 | 2 | 3 | 4 | I can conduct an irrigation audit to determine how long to run a sprinkler. | 1 | 2 | 3 | 4 |
| 1 | 2 | 3 | 4 | I know the benefits of landscaping with native plants. | 1 | 2 | 3 | 4 |
| 1 | 2 | 3 | 4 | I know how to determine the water needs of my landscape. | 1 | 2 | 3 | 4 |

Section IV Personal Characteristics

All information will be kept confidential. Please select the best answer by placing a check in the box next to the answer.

29. Gender

- Female
 Male

30. Age

- 18-25
 26-35
 36-45
 46-55
 55-65
 66-75
 76-85
 85 or older

Continues on next page →

31. What is your predominant ethnicity?

- White (Non-Hispanic)
- Black/African American
- Hispanic
- Native American
- Asian
- Other

32. Education

- Less than high school
- High School degree
- Some College
- Bachelor's degree
- Master's degree
- Doctoral degree

33. Income

- \$25,000 or less
- 25,001 to 45,000
- \$45,001 to 65,000
- 65,001 to 75,000
- 75,001 or higher

34. Home

- Own home
- Rent home
- Rent apartment

35. How do you water your landscape?

- No irrigation
- Hand held sprinkler
- Hose-end yard sprinkler
- Irrigation system

36. How do you maintain your landscape

- I maintain my own landscape
- I hire landscape maintenance 1 or 2 times a year
- I hire landscape maintenance 3 to 4 times a year
- I hire landscape maintenance weekly during the mowing season

END

Please return the completed questionnaire to the person conducting the information session. Thank you for your time and assistance!

VITA

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 May 1995 - present
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 1988 to 1995
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 Fort Worth, Texas
 1980 to present
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Book of List for Texas Gardeners, contributing author