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AN ECONOMIC ANALYSIS OF THE MARKETING TRENDS OF THE WHOLESALE NURSERY INDUSTRY IN TENNESSEE

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Harry Dott Bryan, Jr.

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ABSTRACT

Changing marketing trends is a major problem facing nursery wholesalers. Developing markets and maintaining market share is of vital importance to insure short term and long term success. Little research has been conducted on the changing economic and marketing trends of nurseries in Tennessee. The purpose of this study was to gather information on the market structure of the Tennessee nursery industry. A survey questionnaire administered personally by the researcher was used to collect data regarding sales by product category, sales by state, share of sales to the firm's largest trading partners, advertising, and transportation.

Ninety randomly selected nurseries from 17 counties were selected from a list of certified nurseries provided by the Tennessee Department of Agriculture. Three nursery classifications were created in terms of acreage in production-small (0-9.9 acres); medium (10.0-99.9 acres); and large (100.0 acres or more). Thirty nurseries comprised each classification. In addition to the preceding classifications, nurseries are also divided into six groups according to annual sales - less than $10,000; $10,000-$49,999; $50,000-$99,999; $100,000-$499,999; $500,000-$999,999; and more than $1,000,000.

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CHAPTER I

THE PROBLEM AND OBJECTIVES OF THE STUDY

I. INTRODUCTION

Description of the United States Nursery Industry

The nursery industry in the United States is a dynamic, multi-million dollar business comprised of many diversified segments. These segments include garden centers that sell plant related items, landscape installation firms, architects and consultants, and landscape maintenance firms (Pinney). Most of the nurseries are classified regarding the type of plant material produced. These classes may include fruit, ornamentals, forest and conservation, and propagation and liner materials (Davidson and Mecklenburg). There are many definitions of nurseries, but it is generally agreed that a nursery is a place where shrubs, trees, vines or perennials are grown to sell through various outlets. This definition excludes florists as they are concerned with the production of foliage and flowering plants for indoor use, whereas nursery products are grown primarily for outdoor use (Pinney).

Most nurseries are wholesale or retail, or a combination of the two. Wholesale nurseries are engaged in the propagation and/or buying of nursery products for resale to retailers, organizational users, and other wholesalers. According to the 1979 Census of Horticultural Specialties, there were 16,812 wholesale nursery businesses in the United States with over 2.7 billion dollars in gross sales of all horticultural commodities (which includes the floricultural products

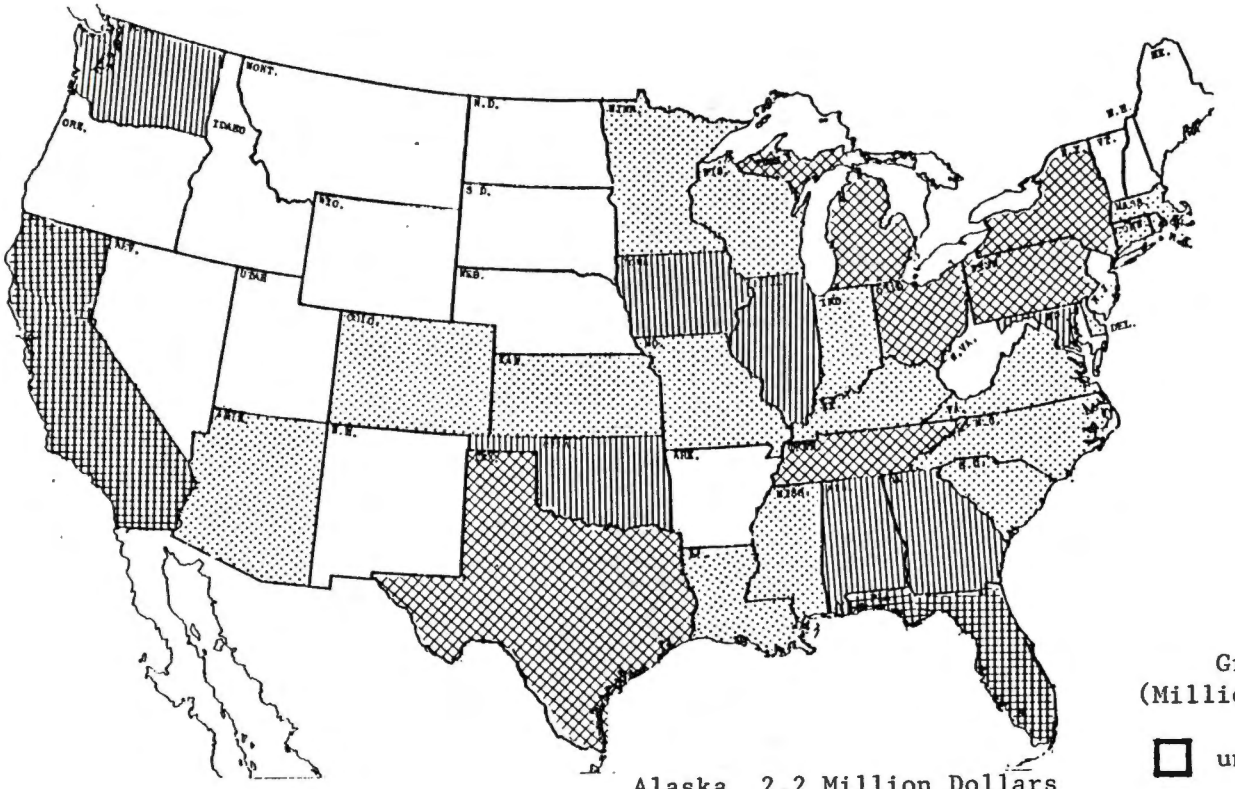
excluded from the definition of nurseries). The Census also reported that there were 5,535 retail nurseries with over 436 million dollars in sales.

All of the fifty states produce some type of nursery product (Figure 1). The production centers of the wholesale nursery industry in the United States are California and Florida with approximately 891 million dollars in combined sales (Morey,1986). The total value of the United States wholesale nursery production in 1986 was 3.141 billion dollars. Table 1 presents the top ten producing states with respect to total sales, from 1982 to 1986. These ten states comprised 66 percent of the total United States wholesale nursery sales in 1986.

Several regions of the United States specialize in certain nursery products. California and Florida are better known for their citrus and fruit trees as well as container production of general nursery products (Davidson and Mecklenburg). Ohio and Illinois grow mostly narrowleaved evergreens, shade trees, and flowering trees. New Jersey produces mostly ornamental plants and ground cover. Michigan specializes in Christmas trees, whereas the New England states are among the leaders in the production of narrowleaved and broadleaved evergreens. The southern states also specialize in broadleaved evergreens as well as deciduous shrubs and ornamental trees.

Description of the Tennessee Nursery Industry

The nursery industry is an important segment of Tennessee's agricultural economy. In 1986, greenhouse and nursery products were the number one agricultural crop in Tennessee (Tennessee Agricultural Statistics).



Source: Morey, 1986 Nursery Business Grower 100

Figure 1. Gross Sales of Nursery Products by State, 1986

Table 1. Total Sales of the Top Ten States Producing Nursery Products, 1982-1986[a]

STATE	1986 RANK	(MIL) SALES	CHANGE PREVIOUS YEAR	1985 RANK	(MIL) SALES	CHANGE PREVIOUS YEAR	1984 RANK	(MIL) SALES	CHANGE PREVIOUS YEAR	1983 RANK	(MIL) SALES	CHANGE PREVIOUS YEAR	1982 RANK	(MIL) SALES	CHANGE PREVIOUS YEAR
CALIF.	1	446.5	+ 2.8%	1	434.5	+10.0%	1	395	+ 0.5%	1	393	- 5.5%	1	416	+ 4.0%
FLA.	2	444.5	+ 7.8%	2	412.5	+10.0%	2	375	+ 1.4%	2	370	+ 2.8%	2	360	-20.0%
N.J.	3	179.2	+45.4%	8	123.2	+10.0%	7	112	+ 1.8%	6	110	- 0.9%	6	111	+11.0%
TEXAS	4	173.5	- 9.9%	3	192.5	+10.0%	3	175	+ 2.9%	3	170	-10.5%	3	190	+18.8%
PENN.	5	163.3	+ 8.0%	4	151.2	+51.2%	10	100	-16.6%	5	120	- 4.0%	5	125	- 3.8%
TENN.	6	152.0	+ 1.3%	5	150.0	+20.0%	5	125	+19.0%	9	105	- 4.5%	7	110	+12.2%
N.Y.	7	145.6	+ 4.2%	6	139.7	+10.0%	4	127	+ 1.6%	4	125	0 %	4	125	0 %
OREGON	8	142.0	+ 7.6%	7	132.0	+10.0%	6	120	+ 9.0%	7	110	+10.0%	10	100	+11.1%
OHIO	9	117.5	+ 1.7%	9	115.5	+10.0%	8	105	0 %	8	105	+ 5.0%	9	100	0 %
MICH.	10	115.9	+ 7.7%	10	107.6	+ 4.5%	9	103	+ 1.9%	10	101	+ 1.0%	8	100	0%

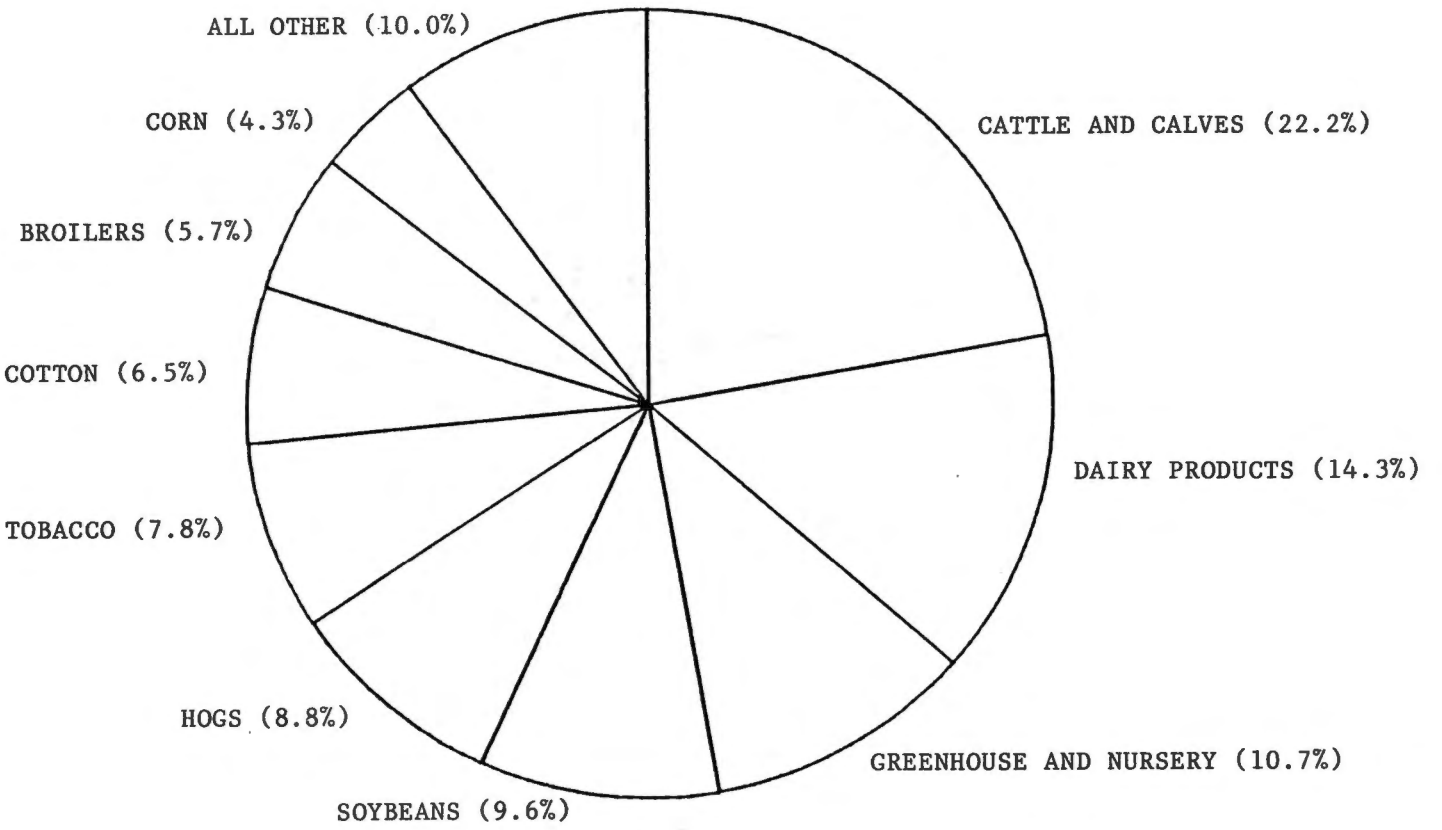
[a]Source: Nursery Business Grower 100 for the years 1982 through 1986.

Gross income from nursery products was estimated to be greater than that of each of the previous top two agricultural products--soybeans and tobacco. The estimated gross income from the production of soybeans was 184 million dollars, while tobacco produced an estimated 143 million dollars in gross income. The estimate for the total value of nursery and greenhouse production was 205 million dollars (Tennessee Agricultural Statistics). Figure 2 illustrates the importance of the nursery industry as percentage of total sales of all agricultural products.

Tennessee has consistently been among the top ten states in the production of nursery products in the United States for the past five years. Total sales increased from 110 million dollars in 1982 to 152 million dollars in 1986 (Morey,1982 and Morey,1986). The Tennessee nursery industry continues to expand, because total sales increased 38.2 percent from 1982 to 1986. Only New Jersey and Oregon experienced higher rates of expansion over this period (Table 2).

According to the Tennessee Department of Agriculture there were 820 certified nurseries in 69 counties with 26,434 acres of nursery grown stock in 1986 (Figure 3). In addition, there were 33 certified nurseries with no acreage reported. The nursery industry is concentrated in Middle Tennessee where Warren County and Dekalb County together have 395 nurseries with 17,421 acres devoted to growing products.

Tennessee nurserymen have gained prominence and reputability for offering a wide variety of nursery products to their buyers. Badenhop found that in 1980, shade trees accounted for a third of the total production of woody ornamentals by gross sales. Dogwoods and other flowering trees were also important products as they comprised 16



Source: Tennessee Agricultural Statistics Service

Figure 2. Tennessee Agricultural Cash Receipts, 1986

Table 2. Percentage Change in Total Sales of Nursery Products From 1982 to 1986 for the Leading Ten States

Rank	State	Percentage Change
1	New Jersey	+61.4%
2	Oregon	+42.0%
3	Tennessee	+38.2%
4	Pennsylvania	+30.0%
5	Florida	+23.5%
6	Ohio	+17.5%
7	New York	+16.5%
8	Michigan	+15.9%
9	California	+ 7.3%
10	Texas	- 8.7%

[a]Source: Nursery Business Grower 100 for the years 1982 and 1986

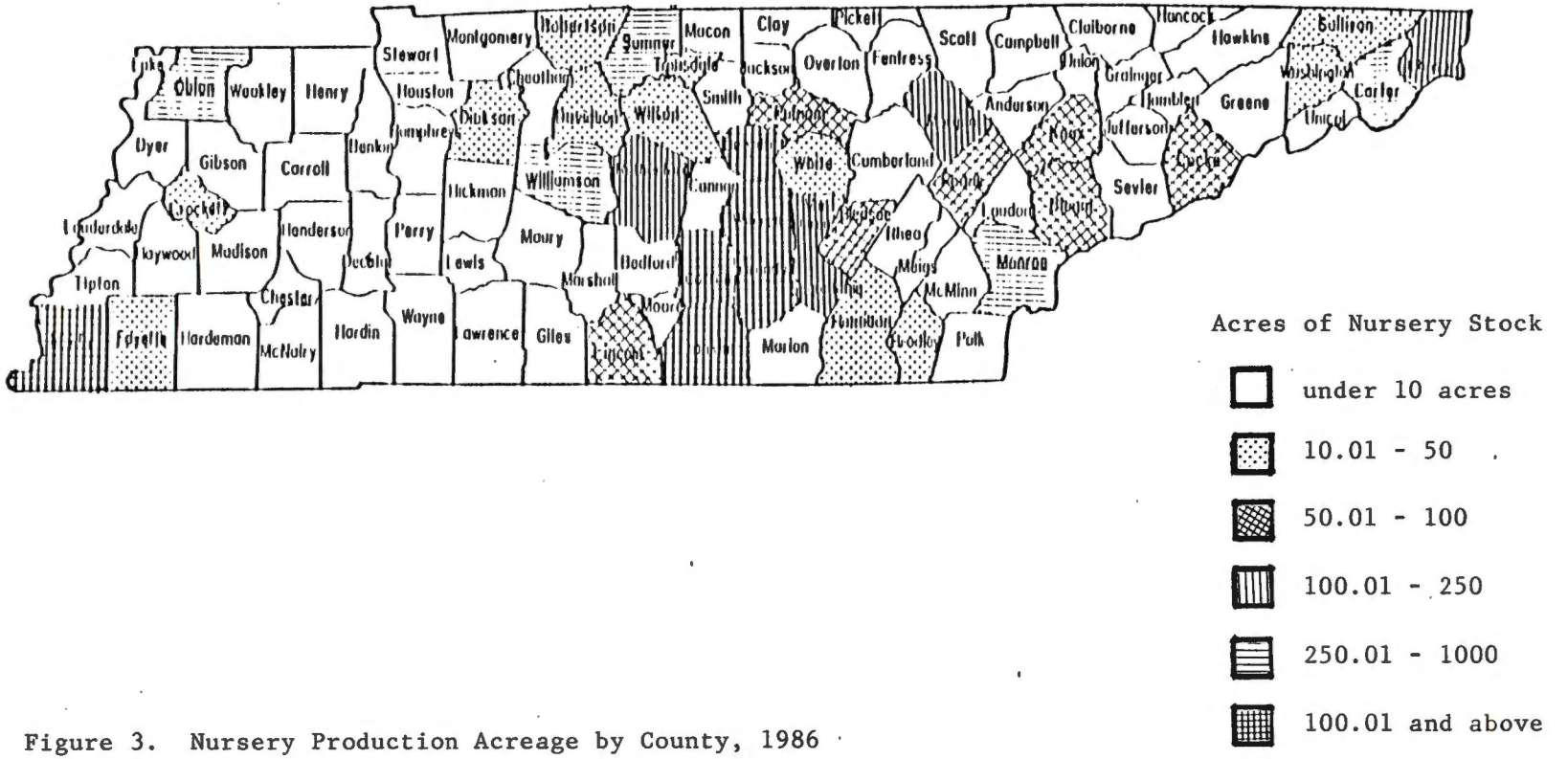


Figure 3. Nursery Production Acreage by County, 1986

percent and 11 percent, respectively, of total gross sales. Of the total gross sales of nursery products produced in Tennessee, 13.5 percent were to buyers in Tennessee. The three leading destination states following Tennessee were Ohio with 9.9 percent, Michigan with 7.6 percent, and Texas with 7.0 percent.

II. STATEMENT OF THE PROBLEM

The nursery business is a long range process which requires careful planning to enhance profitability. To succeed, nursery managers must cope with longer growing cycles of their products. Information on marketing trends and practices should help the industry respond to changes in aggregate supply and demand, such as changes in production in Tennessee and other states, changes in market share by type of market outlet, and changes in demand for various products or product categories.

Although this report examines the business operations of wholesale nurseries, it seems imperative to discuss retail nurseries because they are such an important component of the overall nursery industry. Research on the interaction between wholesale nurseries and retail nurseries as well as landscape contractors is limited, but some empirical studies have been made. A study by Varner and DiLalo concentrated on business operations of nursery retailers in the Middle Atlantic States (Varner and DiLalo). Weisenborn attempted to analyze the decision making process of firms purchasing woody ornamentals for resale in Georgia (Weisenborn). It should be constructive to analyze the relative importance of nursery retailers and landscape contractors to wholesale

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nurseries in order to determine which component of the marketing channel exhibits the greater bargaining power. Nursery operators need basic information regarding product flows, shipping patterns, and trade practices to help identify present and future trends.

Many retail nurseries use large grocery stores and hardware stores as sales outlets. Table 3 lists the top ten retailers of nursery products in the United States as of March, 1987. K-Mart and Wal-Mart, both of whom offer a diverse product line to their customers, also sell nursery related items. Large grocery store chains such as Safeway and Kroger also offer nursery items, and so do some hardware stores.

III. RESEARCH OBJECTIVES

The overall goal of this study was to examine the market structure of the Tennesse nursery industry. Specific objectives were to:

1) identify the procurement and marketing patterns of Tennessee wholesale nurseries, and
2) analyze the current trade flows in order to consider the potential for, and the future direction of growth for the Tennessee nursery industry.

IV. RESEARCH PROCEDURE

In 1986 there were 820 certified nurseries in Tennessee (Tennessee Department of Agriculture). These nurseries were separated into three size categories according to acreage so that a stratified random sample could be taken. A personal questionnaire was administered by the researcher with the selected nursery businesses. A letter explaining

Table 3. The Top Ten Nursery Retailers in the United States as of March, 1987

NAME	1987 RANK	1987 SALES (MIL)	1987 TOTAL STORES	1986 RANK	1986 SALES (MIL)	1986 TOTAL STORES
K-MART	1	700	2500	1	600	2500
GENERAL HOST	2	375.4	218	2	250	157
WAL-MART	3	295.5	980	9	75	745
COTTER & CO.	4	190	7000	3	175	7000
AMERICAN HARDWARE	5	168	3800	-	-	-
SUN BELT NURSERY	6	132	114	4	125.6	106
SAFEWAY	7	130	2400	5	120	2400
ACE HARDWARE	8	110	4000	6	100	4000
KROGER	9	98	1033	8	75	1200
SEARS	10	95	800	7	100	800

Source: Nursery Business Retailer 100, 1986
Nursery Business Retailer 100, 1987

the research project was sent to all participants before the interview informing them they had been selected for the study.

To accomplish the first objective, information from nursery managers relating to sources of liners and seedlings as well as outlets for each product group were needed. To analyze procurement practices, data regarding purchases versus propagation, purchases by product category, purchases by state of origin, and purchases from the firm's largest suppliers were also needed. To analyze the marketing patterns, information relating to sales by type of purchaser, sales by state, share of sales to the firm's largest customers and the firm's advertising methods were required. Information regarding transportation methods and costs were needed. Questions were designed to obtain data about the shipping methods and the amount of nursery stock shipped by each of these methods.

CHAPTER II

REVIEW OF LITERATURE

Much of the literature dealing with the nursery industry focuses on the structure of the industry within respective states. Some studies have also examined marketing trends and problems. Scroggs and Britt conducted interviews with 289 out of 427 certified Tennessee nurserymen in 1959. They analyzed selected strategies for improvement in marketing nursery stock also analyzed the pertinent components of the nursery industry. Problems identified in their study included production problems associated with various cultural practices as well as those problems related to marketing. They noted that smaller growers occasionally experienced marketing problems because the larger growers controlled such a large share of the market. Also, larger growers were generally more innovative, quality conscious, and offered a wider variety of products to buyers.

Based on a survey in 1965 of 62 nursery operations in Tennessee, Goble and Brown concluded that labor shortages, weather uncertainty, and weed control were the major problems confronting the nurserymen. Deciduous shrubs and ornamental trees were the highest selling products in terms of quantity. Sales between different types of firms were analyzed, with corporations having the highest sales, followed by individual proprietorships and partnerships. Corporate firms comprised only 9 percent of the surveyed firms, but accounted for 55 percent of total sales. Illinois, Michigan, Ohio, and Pennsylvania accounted for 74 percent of all sales made outside of Tennessee.

A mail survey of the woody ornamental nursery industry in the South was conducted in 1969 by members of the Southern Regional Technical Committee SM-33. As a regional effort by 11 states, a total of 617 nurseries were analyzed. Those firms with less than $2000 in annual sales were not considered. Major production issues discussed were labor shortages, weather hazards, and weed control. The major marketing problems were noted as incomplete knowledge of consumer preferences, changes in preferences for different plant forms, and difficulty in selling plants to government agencies. In terms of dollar sales Florida was the leading state, followed in descending order by Virginia, Texas, Tennessee, and Alabama. Broadleaf evergreens and deciduous shrubs were the two most popular product categories being sold. Perhaps the most interesting highlights of the study included the findings that 72 percent of the sales of woody ornamentals were made to buyers within a 25 mile radius of the nursery and that only 7 percent of the sales were to markets in states outside of the South.

Badenhop attempted to analyze product sales, sales outlets, product mix, and type of plants sold by Tennessee nurserymen in 1980. Ten states provided sufficient markets for 69 percent of the total value of woody ornamental sales of the 38 nurserymen surveyed. Only 14 percent of the total sales of woody ornamentals were sold to market outlets in Tennessee. The states providing the largest markets for Tennessee woody ornamentals, in descending order, were Ohio, Michigan, Texas, Illinois, and Georgia. Shade trees and deciduous shrubs accounted for 83 percent of gross sales by the surveyed Tennessee nurserymen. The prevalent

marketing forms of the plants were balled-and- burlapped and bare root, which together accounted for 65 percent of gross sales.

Gineo and Conlon analyzed the destination and procurement sources of woody ornamentals in Connecticut in 1986. Other than the markets in Connecticut (39 percent of total sales), the leading destinations were Massachusetts (18.7 percent), New York (16.2 percent) and Pennsylvania (8.1 percent). The researchers raised the point that the Connecticut growers may be too concentrated in one region and may need to expand in other markets to capture a share of the growing demand for nursery stock in other regions.

Another report by Gineo attempted to analyze the potential consumer demand for nursery goods and related sources. The demographic, economic, physical, and technical environment were analyzed. Among the topics discussed were expansion among firms, types of potential buyers, and improvements in the nursery industry. One demographic variable suggests that higher education has been associated with increased purchases of nursery goods. An economic variable such as household income suggests that higher income levels may lead to greater purchases of nursery goods. Gineo concluded that all these variables in addition to housing starts and industry adjustments, could lead to an increased demand for nursery goods and services.

Varner and DiLalo examined the operations of 121 retail nurseries and garden centers in Georgia in 1982 to provide data and information to industry members and wholesale operations. Issues identified as important were marketing activities, plant material sold, terms of credit, and type of services offered.

Weisenborn conducted personal interviews in 1971 of retail nurseries in Georgia with at least $3500 in annual sales. Important factors listed as affecting purchasing decisions for resale were expected sales, landscape contracts, and plant availability. Factors affecting the choice of suppliers were quality plants and good business relations among channel members.

CHAPTER III

SURVEY TECHNIQUES

Attention must be given to the possible sampling procedures that may be utilized in data collection. Four sampling methods are discussed in this chapter with respective advantages and disadvantages. In addition, the logic for utilizing the personal interview format is discussed along with an explanation of the questionnaire design.

I. SAMPLING METHODS

The simple random sample is a method of selecting n units out of a population of N so that each unit has an equal chance of being chosen. This is done by assigning each member of the population a number from 1 to N. Then, by means of a random numbers table or by placing the numbers in a hat, a series of numbers from 1 to N are drawn. The number of units drawn represents the sample size. One advantage of the simple random sample is that minimum knowledge is required in advance of the population. However, a tradeoff of knowledge that is useful to the researcher about the population is not utilized. Also, there are no classification errors associated with this method of sampling and it is fairly easy to analyze the data set (Miller, 1964).

Stratified sampling involves dividing the population N into subpopulations (N_1, N_2,...N_n). The subpopulations are called strata, and to determine the sample size, a random sample is taken from each strata. This technique of sampling is very useful as it allows each subpopulation to be treated as a population (Cochran,1953). In addition it

insures representation with respect to the subpopulation. Another advantage is that each strata can be compared to each other. Unlike the simple random sample, information about each strata as it relates to the proportion of the population is required, otherwise the presence of errors exist (Miller, 1964).

Multistage sampling (also called subsampling) involves taking a sample of a unit of the total population. Multistage sampling can be used with other methods such as stratified sampling and systematic sampling. Some disadvantages are that errors will probably be larger than the errors with simple random or systematic sample of the same sample size.

Systematic random sampling is selecting units at present intervals throughout the population. For example, the units of a population may be ordered from 1 to N. To get a sample size, a number selected at random (m) is used and every m^{th} unit is drawn throughout the population. If there is order within the population related to some variable, then it gives stratification effect and reduces variability as compared to a simple random sample. However, one disadvantage of this method is that the possibilities of errors exist when there is a stratification effect (Miller, 1964).

The sampling method used in this study was a variation of the systematic random sample and a stratified sample. Stratification allowed the population to be divided into three classifications according to acreage under production: small, medium, and large. The list of all certified nurseries was obtained from the Tennessee Department of Agriculture. All certified nurseries were arranged in order by acres

from smallest to largest. The breakpoint of the three stratas were 9.9 acres and 99.9 acres. There were 477 certified nurseries in the first strata. Thirty nurseries was specified as the sample size for each strata for a total of 90 observations. The logic was to get the normal distribution of a different sample group. A sampling ratio of N/m was used to obtain the selection variable. This variable computed to N/m = 477/30 = 15.9 or 16. A random number was chosen to begin the selection of nurseries for the sample. Every sixteenth unit in the first strata was chosen to represent the sample size of that strata.

The sampling ratio for medium nurseries was 8. This was computed as N/m = 277/30 = 8.03 or 8. For the second strata every eighth unit was picked until thirty nurseries was selected to represent the sample size for this group. The sampling ratio for the third strata was computed as N/m = 59/30 = 1.9 or 2. As before, every second unit of this group was selected for the sample.

II. LOGIC FOR PERSONAL INTERVIEW METHOD

The method used to gather the data was a personal interview with each nursery operator selected for the study. There are many advantages of using this method. Most people are willing to cooperate with a personal interview; therefore, one can expect a high rate of response. In addition, when the interviewer can secure the information and responses personally, the results are more likely to be complete than with other techniques. Many of the questions on the survey are sensitive, so the interviewer can carefully handle the situation for maximum response. Also, with a personal interview the questions can be discussed so that

the respondent understands what information is required. The interviewer can also make return visits to a location to correct any mistakes or to complete any questions that were unanswered on the earlier visit.

Other research methods such as a mail questionnaire format were considered but not selected for a variety of reasons. The survey instrument was quite lengthy (6 pages), so it was felt that many nurseries would not take the time to complete the questionnaire. In addition, several sensitive topics were covered such as major markets, gross sales, and suppliers, and these topics would not be appropriate for a mail survey. Also, the response rate to mail questionnaires is fairly low (less than 50 percent) when conducted by inexperienced individuals (Miller, 1964).

III. QUESTIONNAIRE DESIGN

The data collection period was during the months of October and early November, 1987. Ninety nurseries from 17 counties were selected to participate. Upon selecting the nurseries for the survey, a letter explaining the research project was sent to all participants informing them that they had been selected for the study. Prior to collecting the data a nursery was chosen as a representative of the population for a pre-test of the questionnaire. Many suggestions were discussed with the nursery operator as to how the survey could be improved to avoid misunderstandings or ambiguous questions. The first part of the survey contained easy questions that the respondent would enjoy answering and were designed to help develop good relations with the manager. Gradually the questions became tougher and required considerable thought for answers,

specifically questions 9a through 16b (Appendix A). After this point, the survey was designed to relax the respondent with easy questions.

CHAPTER IV

SURVEY RESULTS

The results of the survey are presented in this chapter. First, the results of the general characteristics of Tennessee nurseries, such as annual sales, age and type of firms, professional affiliations, size of nurseries, and labor characteristics are discussed. Second, the marketing practices of Tennessee nurseries are examined. This includes types of products for sale, advertising, transportation, and pricing decisions. Third, destinations of nursery products are discussed as well as origins of seedlings and liners. Finally, the marketing trends of woody ornamentals are evaluated. Topics such as plant preferences, shipping preparation methods, business expansion, as well as problems of the Tennessee nursery industry particularly relating to production and business limitations are presented.

I. GENERAL CHARACTERISTICS

As noted earlier, the ninety randomly selected nurseries were divided into three classifications: small, medium, and large. Nurseries with 9.9 acres or less of nursery stock are classified as small nurseries, those with 10.0 acres to 99.9 acres were categorized as medium, and nurseries with 100.0 acres or more of nursery stock comprised the large category. Most of these nurseries specialize in different products, so in many cases the aforementioned size classifications can be misleading. To offer a useful comparison, analysis was also performed on nurseries grouped into six annual gross sales categories: less than 10,000 dol-

lars, 10,000-49,999 dollars, 50,000-99,999 dollars, 100,000-499,999 dollars, 500,000-999,999 dollars, and 1,000,000 dollars or more.

Age of Firms

The date of establishment was categorized in ten year intervals. Of the 90 certified nurseries surveyed, 52 (58 percent) were established since 1970 (Table 4). Of these nurseries, 31 (34 percent) were established between 1970 and 1979 and 21 nurseries (24 percent) were established since 1980. During the period of 1960-1969, 20 percent of the nurseries were established, 10 percent between 1950-1959, and the remaining 12 percent were established prior to 1950. An interesting point to note is that 37 percent of the small nurseries and 27 percent of the medium nurseries were established prior to 1970, but 63 percent of the larger nurseries were established prior to 1970.

Type of Ownership

About 62 percent of all firms in the survey were proprietorships (Table 5). Partnerships and corporations comprised 19 percent each of firm types in the survey. Fourteen of the large nurseries were corporations, while 12 were proprietorships and 4 were partnerships. Among the medium sized nurseries only 2 were corporations, but 22 of the medium nurseries were proprietorships. Only 6 of the medium nurseries were partnerships. The type of ownership among smaller nurseries closely resembled the medium group with 22 nurseries being proprietorships, 7 being partnerships and only 1 being corporation.

Professional Affiliations

More than half of the surveyed nurseries, 59 percent, had memberships with one or more professional organizations (Table 6). Forty-

Table 4. Period of Establishment of 90 Surveyed Nurseries, Tennessee, 1986

Nursery Size[a]	Prior to 1950		1950-1959		1960-1969		1970-1979		1980 to present		Total	
	number	percent	number	percent	number	percent	number	percent	number	percent	number	percent
Small	2	2.2	5	5.6	4	4.4	9	10.0	10	11.1	30	33.3
Medium	2	2.2	1	1.1	5	5.6	14	15.5	8	8.9	30	33.3
Large	7	7.8	3	3.3	9	10.0	8	8.9	3	3.3	30	33.3
Total	11	12.2	9	10.0	18	20.0	31	34.4	21	23.3	90	99.9[b]

[a] Small 0.0-9.9 acres, Medium 10.0-99.9 acres, Large 100.0 acres or more

[b] Does not equal to 100.0 due to rounding error

Table 5. Type of Ownership of 90 Surveyed Nurseries, Tennessee, 1986.

Nursery Size[a]	Proprietorship		Partnership		Corporation		Total	
	number	percent	number	percent	number	percent	number	percent
Small	22	24.4	7	7.8	1	1.1	30	33.3
Medium	22	24.4	6	6.7	2	2.2	30	33.3
Large	12	13.3	4	4.4	14	15.6	30	33.3
Total	56	62.1	17	18.9	17	18.9	90	99.9[b]

[a] Small 0.0-9.9 acres, Medium 10.0-99.9 acres, Large 100.0 acres or more

[b] Does not equal to 100.0 due to rounding error

Table 6. Professional Affiliations of 90 Surveyed Nurseries, Tennessee, 1986

Nursery Size[a]	TNA[b]		MTNA[c]		SNA[d]		ANA[e]		UPPER[f]		ETHLA[g]		WTNA[h]		TOTAL	
	firms	percent	firms	percent	firms	percent	firms	percent	firms	percent	firms	percent	firms	percent	firms	percent
Small	6	20.0	3	10.0	2	6.7	4	13.3	4	13.3	1	3.3	-	-	12	40.0
Medium	11	36.7	11	36.7	5	16.7	1	3.3	1	3.3	-	-	1	3.3	15	50.0
Large	26	86.7	25	83.3	25	83.3	19	63.3	-	-	-	-	-	-	26	86.7
Total	43	47.8[i]	39	43.3[i]	32	35.6[i]	24	26.7[i]	5	5.6[i]	1	1.1[i]	1	1.1[i]	53	58.9[i]

[a] Small 0.0-9.9 acres, Medium 10.0-99.9 acres, Large 100.0 acres or more

[b] Tennessee Nurseryman's Association

[c] Middle Tennessee Nurseryman's Association

[d] Southern Nurseryman's Association

[e] American Nurseryman's Association

[f] Upper East Tennessee Christmas Tree and Shrubbery Growers Association

[g] East Tennessee Horticultural and Landscape Association

[h] West Tennessee Nurseryman's Association

[i] Proportion of 90 surveyed nurseries with memberships

eight percent of the nurseries in the survey had memberships with the Tennessee Nurseryman's Association (TNA) and 43 percent had memberships with the Middle Tennessee Nurseryman's Association (MTNA). Also, memberships in the Southern Nurseryman's Association (SNA) and the American Nurseryman's Association (ANA) were reported by 36 and 27 percent, respectively, of the nurseries. The East Tennessee Horticultural and Landscape Association (ETHLA), West Tennessee Nurseryman's Association, and Upper East Tennessee Christmas Tree and Shrubbery Growers Association had only 8 percent of the surveyed nurseries as members. Eighty-seven percent of the larger nurseries were affiliated with a professional organization, compared to 50 percent of the medium and 40 percent of the smaller nurseries.

Labor Characteristics

Most of the small nurseries had an average of one full-time worker and two temporary workers (Table 7). Medium nurseries had an average of two full-time workers and four temporary workers, whereas, large nurseries had an average of 24 full time workers and 25 temporary workers.

Table 7. Labor Characteristics of 90 Surveyed Nurseries, Tennessee, 1986

Nursery Size[a]	Full-Time		Temporary	
	average	range	average	range
Small	1	0-4	2	0-15
Medium	2	0-12	4	1-15
Large	24	3-245	25	0-100

[a]Small 0.0-9.9 acres, Medium 10.0-99.9 acres, Large 100.0 acres or more

Annual Gross Sales

Of the ninety surveyed nurseries, only 19 percent were listed as corporations (Table 8). However, these firms accounted for 55 percent of total annual sales, averaging $1,200,588 per nursery. Proprietorships accounted for 33 percent of total sales, and partnerships accounted for the remaining 12 percent, averaging $219,591 and $263,794 per nursery, respectively.

Table 8. Annual Gross Sales by Type of Organization, 90 Surveyed Nurseries, Tennessee, 1986

Type	Nurseries		Gross Sales		
			Average per nursery	Standard Deviation	Distribution of Total Sales
	number	percent	dollars		percent
Proprietorships	56	62.1	219,591	397,261	33
Partnerships	17	18.9	263,794	398,924	12
Corporation	17	18.9	1,200,588	1,070,846	55
Total	90	99.9[a]			100

[a] Does not equal to 100.0 due to rounding error

Among size classifications the smaller nurseries averaged $24,301 per firm in gross sales, while the medium and larger nurseries averaged $103,420 and $1,112,000, respectively (Table 8). An interesting point to note is that smaller nurseries had average sales of $7,513 per acre, with medium and larger nurseries averaging $4,190 and $3,526 per acre, respectively (Table 9). The average size of smaller nurseries was 3.2 acres, medium nurseries, 24.7 acres, and larger nurseries, 315.3 acres of nursery grown stock.

Table 9. Annual Gross Sales by Size Category, 90 Surveyed Nurseries, Tennessee, 1986

Nursery Size	Nurseries	Average Acreage per nursery	Annual Sales	Average Gross per nursery	Average Gross per acre
	number	acres	dollars		
Small	30	3.2	329,015	24,301	7,513
Medium	30	24.7	3,102,600	103,420	4,190
Large	30	315.3	33,360,000	1,112,000	3,526

[a]Small 0.0-9.9 acres, Medium 10,0-99.9 acres, Large 100.0 acres or more

The market concentration ratio is a measure depicting the market share of a selected number of the largest firms, when ranked in descending order of market shares. These ratios provide only a rough indication of the degree of market power possessed by the larger nurseries, because producers specialize in different products within the industry, costs are not taken into account, and sales data were not obtained from the other large nurseries excluded from the survey. Among the ninety surveyed nurseries, the largest four accounted for 30 percent of sales (Table 10). If the sample is proportionately representative of the total population of nurseries, then the four-firm concentration ratio of 30 percent would not be high enough to create concern about the larger firms exercising oligopolistic power (Scherer).

Table 10. Concentration Values for the 90 Surveyed Nurseries, Tennessee, 1986

Group of Firms	Percent of Total Sales
Largest 4	30
Largest 8	47
Largest 20	73
Largest 50	82

II. MARKETING PRACTICES

Wholesale Production

Wholesale producers often produce a wide variety of plant types. To permit useful comparison, plant types were divided into eleven categories. Table 11 presents the distribution of sales by type of crop category for the 90 surveyed nurseries.

Less than $10,000: Evergreen trees are the most widely produced crop among nurseries with less than 10,000 dollars in annual sales. On average among these nurseries, thirty-five percent of annual sales were accounted for by evergreen trees. Another 17 percent of this nursery group's total sales was accounted for by deciduous ornamental trees, followed by deciduous shade trees with 16 percent. None of the nurseries in this category sold vines and ground cover, perennials, or roses.

10,000-49,999 dollars: The most popular products sold among nurseries in this group were deciduous shade trees (55 percent of firms), deciduous ornamental trees (50 percent), broad-leaved evergreen shrubs (35 percent), and evergreen trees (35 percent). While only 20 percent of the nurseries in this group sold fruit trees, this product category accounted for 22 percent of gross sales, which was the highest percentage of the various product groups. Deciduous shade trees were the next most important product category (15 percent of sales) followed closely by broad-leaved evergreen shrubs and deciduous ornamental trees, both with roughly 14 percent of annual sales. Few nurseries produced perennials (10 percent) and roses (5 percent), and none of the nurseries produced foliage plants.

Table 11. Distribution of Nurseries and Gross Sales by Type of Product Produced, 90 Surveyed Nurseries, Tennessee, 1986.

	Annual Sales in Dollars													
	Less than 10,000		10,000-49,999		50,000-99,999		100,000-499,999		5000,000-999,999		More than 1,000,000		Total	
Type of Product	Firms	Sales	Firms	Sales	Firms	Sales	Firms	Sales	Firms	Sales	Firms	Sales	Firms	Sales
	percent													
Deciduous Shade Trees	24	15.6	55	15.4	75	31.2	88	40.2	80	36.2	93	30.5	67	32.3
Deciduous Ornamental Trees	24	17.2	50	13.4	67	23.8	81	18.1	90	22.1	87	15.5	63	17.1
Fruit Trees	12	7.7	20	22.2	58	20.2	6	3.2	10	8.2	27	14.5	21	12.5
Evergreen Trees	35	35.2	35	11.6	42	11.6	44	9.6	50	15.1	80	10.2	47	11.2
Deciduous Shrubs	24	8.8	30	7.2	25	6.7	63	8.5	50	4.6	87	11.8	46	10.0
Broad-leaved Evergreen Shrub s	18	3.8	35	14.5	17	4.8	50	8.2	80	10.1	60	7.4	41	8.0
Vines and Ground Cover	-	-	15	3.2	1	0.8	8	7.9	30	1.3	47	3.8	24	3.7
Narrow-leaved Shrubs	18	2.3	25	11.6	8	0.8	31	3.3	40	1.9	60	3.8	30	3.4
Perennials	-	-	10	0.6	-	-	13	0.3	-	-	20	0.2	8	1.6
Foliage Plants	6	9.5	-	-	-	-	6	0.1	10	0.6	13	0.1	6	0.2
Roses	-	-	5	0.2	-	-	19	0.6	-	-	7	b	6	b
Total		100.1[c]		99.9[c]		99.9[c]		100.0		100.1[c]		99.8[c]		100.0

[a] Many firms sold crops in more than one category [b] Less than .1 percent [c] Does not equal to 100.0 due to rounding error

50,000-99,999 dollars: Nurseries in this group tended to specialize more in the production of trees rather than shrubs or small plants. Seventy-five percent of these nurseries sold deciduous shade trees, followed by deciduous ornamental trees (67 percent), fruit trees (58 percent), and evergreen trees (42 percent). Small crops such as deciduous shrubs were sold by 25 percent of the firms and 17 percent sold broad-leaved evergreen shrubs. None of these nurseries sold perennials, foliage plants, or roses. Deciduous shade trees accounted 31 percent of total sales for this nursery group, deciduous ornamental trees 24 percent, and fruit trees 20 percent. Deciduous shrubs accounted for about 7 percent of total sales, followed by evergreen shrubs with nearly 5 percent of total sales.

100,000-499,999 dollars: Nurseries in this group tended to be more diverse in their sales of horticultural commodities than the smaller nurseries. Deciduous shade trees were sold by 88 percent of these nurseries, deciduous ornamental trees by 81 percent and deciduous shrubs by 63 percent of the nurseries. Unlike the three smaller nursery sales groups, a greater percentage of nurseries in this sales group sold vines and ground cover and roses. However, even though 19 percent sold roses, the sales of roses accounted for less than one percent of sales. Deciduous shade trees accounted for the majority of sales with 40 percent. Eighteen percent of total sales were accounted for by deciduous ornamental trees, and 10 percent by evergreeen trees. Deciduous shrubs, broad-leaved evergreen shrubs, and vines and ground cover each accounted for 8 percent of total sales.

500,000-999,999 dollars: Nurseries in this annual sales group also exhibited diversification among product categories, but they did tend to generate more sales from trees than shrubs. Deciduous ornamental trees were sold by 90 percent of these firms, whereas 80 percent sold deciduous shade trees and broad-leaved evergreen shrubs. Fifty percent of the nurseries sold evergreen trees and deciduous shrubs. Vines and ground cover were sold by 30 percent of the nurseries, followed by fruit trees and foliage plants which were sold by 10 percent of these nurseries. None of these nurseries sold roses or perennials. Nearly 36 percent of total sales were accounted for by deciduous shade trees, 22 percent by deciduous ornamental trees, and 15 percent by evergreen trees. Although 30 percent of these nurseries produced vines and ground cover, this product category accounted for only one percent of total sales.

More than 1,000,000 dollars: Nurseries in this annual sales group continued the trend observed with the five preceding nursery groups, which is, the larger the annual sales, the greater the diversity of sales among product categories. Ninety-three percent of the nurseries in this group sold deciduous shade trees and 87 percent sold deciduous ornamental trees amd deciduous shrubs. Evergreen trees were sold by 80 percent of the nurseries, followed by narrow-leaved shrubs and broad-leaved evergreen shrubs, each category being sold by 60 percent of these nurseries.

Deciduous shade trees accounted for the majority of total sales with nearly 31 percent, followed by deciduous ornamental trees with 16 percent of total sales. Fifteen percent of sales were accounted for by

fruit trees, 12 percent by deciduous shrubs and 10 percent by evergreen trees, and 7 percent by broad-leaved evergreen shrubs.

Overall, deciduous shade trees and deciduous ornamental trees were the major product categories sold by all surveyed nurseries. Sixty-seven percent of all nurseries sold deciduous shade trees, whereas 63 percent sold ornamental trees. These two products accounted for the majority of total sales with shade trees accounting for 32 percent and ornamental trees 17 percent. Fruit trees were also an important product, accounting for nearly 13 percent of total sales. This product category was grown primarily by nurseries with less than 100,000 dollars in annual sales. Evergreen trees, deciduous shrubs, and broad-leaved evergreen shrubs were also substantial contributors to total sales.

Table 12 illustrates average annual sales by type of product. Nurseries with less than 10,000 dollars in sales averaged 3,094 dollars in total nursery sales per year. Of this nursery group's average, evergreen tree sales accounted for $1,088, followed by deciduous ornamental trees ($532), deciduous shade trees ($482), foliage plants ($294) and deciduous shrubs ($272).

10,000-49,999 dollars: Nurseries in this group averaged $25,962 per year. Fruit trees contributed the most of the eleven product categories, averaging $5,775 in sales in 1986. Deciduous shade trees and broad-leaved evergreen shrubs accounted for $3,985 and $3,769 of the average annual sales value, respectively. Deciduous ornamental trees and narrow-leaved shrubs were also important with $3,473 and $3,019 in annual sales, respectively. There were no sales in foliage plants among these nurseries.

Table 12. Average Annual Nursery Sales by Type of Product, 90 Surveyed Nurseries, Tennessee, 1986

Type of Product	Annual Sales in Dollars					
	Less than 10,000	10,000-49,999	50,000-99,999	100,000-499,999	500,000-999,999	More than 1,000,000
	dollars					
Deciduous Shade Trees	482	3,985	21,005	88,309	249,750	516,500
Deciduous Ornamental Trees	532	3,473	15,979	39,753	152,500	262,333
Fruit Trees	238	5,775	13,604	7,031	56,250	245,000
Evergreen Trees	1,088	3,013	7,803	21,063	104,500	173,267
Deciduous Shrubs	272	1,880	4,525	18,641	31,875	200,500
Broad-Leaved Evergreen Shrubs	118	3,769	3,250	18,031	69,350	125,850
Vines - Ground Cover	0	830	542	17,359	8,725	65,000
Narrow-Leaved Shrubs	70	3,019	542	7,281	13,050	64,017
Perennials	0	155	0	766	0	38,067
Foliage Plants	294	0	0	156	4,000	2,133
Roses	0	63	0	1,234	0	667
Total	3,094[a]	25,962[a]	67,252[a]	219,264[a]	690,000	1,693,334[a]

[a]Does not equal to exact gross sales mean due to rounding error

50,000-99,999 dollars: Nurseries in this category specialized mostly in the production of trees. Deciduous shade trees, deciduous ornamental trees, and fruit trees accounted for $21,005, $15,979 and $13,604 of the average annual sales value for this nursery group, respectively. Evergreen trees were also important as they accounted for $7,803 of the group's average annual sales. Shrubbery sales was not a major factor of nurseries in this group. An average of $3,250 of broad-leaved evergreen shrubs was sold. Vines and ground cover and narrow-leaved shrubs each accounted for $542 in annual sales.

100,000-499,999 dollars: Deciduous shade trees accounted for an important share of annual sales for nurseries in this group with an average of $88,309. Deciduous ornamental trees were the next most important ($39,753), followed by evergreen trees with $21,063 in annual sales. Deciduous shrubs, broad-leaved evergreen shrubs, and vines and ground cover accounted for an average of $18,641, $18,031, and $17,359 in sales, respectively. An average of $7,281 was obtained from narrow-leaved shrub sales, followed by fruit trees and roses with $7,031 and $1,234 in average sales, respectively. Perennials and foliage plants were not important products to this group, as they accounted for only $766 and $156 in average annual sales, respectively.

500,000-999,999 dollars: Nurseries in this group averaged $690,000 in annual gross sales. The most important product category was deciduous shade trees with $249,750 in sales, followed by deciduous ornamental trees and evergreen trees with $152,500 and $104,500 in average sales, respectively. Broad leaved evergreen shrubs was also a meaningful product category as it accounted for $69,350, followed by fruit

trees and deciduous shrubs with $56,250 and $31,875 in average annual sales, respectively. Narrow-leaved shrubs accounted for $13,050, vines and ground cover with $8,725, and foliage plants with $4000 in average sales, respectively. There were no sales in the roses and perennials categories among nurseries in this group.

More than 1,000,000: Nurseries in this group averaged $1,693,333 in annual sales in 1986. Deciduous shade trees were the most important product with $516,500 in average annual sales. Deciduous ornamental trees were next with $262,333, followed closely by fruit trees and deciduous shrubs with $245,000 and $200,500 in average sales, respectively. Evergreen trees accounted for $173,267 and broad-leaved evergreen shrubs for $125,850 in average sales, respectively. Vines and ground cover sales averaged $65,000, narrow-leaved shrubs contributed $64,017, and perennials accounted for $38,067 in average annual sales. Again, foliage plants and roses were not important product categories as they accounted for only $2,133 and $667, respectively, in average sales.

Advertising

Advertising is a major tool companies may use to disseminate messages to its target market by various media. Noteably, only 49 nurseries in the survey used some form of advertising (Table 13). Twenty-seven of the larger nurseries, 15 of the medium nurseries, and only 7 of the smaller nurseries used advertising. The three major types of advertising used by the nurseries were mass media, industrial, and private.

Table 13. Nurseries Using Some Form of Advertising, 90 Surveyed Nurseries, Tennessee, 1986

Nursery Size[a]	Engaged in Advertising			
	Yes	No	Yes	No
	Number		Percent	
Small	7	23	7.8	25.6
Medium	15	15	16.7	16.7
Large	27	3	30.0	3.3
Total	49	41	54.4	45.6

[a]Small 0-9.9 acres; Medium 10.0-99.9 acres; Large 100.0 acres or more

Table 14 presents the frequency of nurseries utilizing advertising by different sales groups. Nurseries with at least $100,000 in annual sales were more likely to engage in advertising than those nurseries with fewer sales. The percentage of negative response was inversely related with the size of nurseries in terms of annual sales.

Table 14. Nurseries Using Some Form of Advertising, by Annual Sales, 90 Surveyed Nurseries, Tennessee, 1986.

Annual Sales in Dollars	Engaged in Advertising			
	Yes	No	Yes	No
	Number		Percent	
Less than 10,000	3	14	3.3	15.6
10,000-49,999	5	15	5.6	16.7
50,000-99,999	4	8	4.4	8.9
100,000-499,999	12	4	13.3	4.4
500,000-999,999	10	0	11.1	-
More than 1,000,000	15	0	16.7	-
Total	49	41	54.4	45.6

Mass media advertising utilizes radio, television, and newspapers. Table 15 presents the distribution of total advertising expenditure by the surveyed nurseries for each media type. Industrial advertising refers to participation in trade shows and advertisements in trade journals. Trade shows enable nurseries to display or demonstrate their products to potential buyers. The participants may introduce new varieties, maintain contacts, and meet potential customers. Advertising in trade journals allows the firm to display its logo, production specialties, or company location at a cost proportional to the size of the advertisement. Private advertising, or the distribution of wholesale catalogs, was the most popular form of advertising used by the surveyed nurseries, particularly among the larger operations. These catalogs list most of the varieties, sizes, and prices of plants a particular firm may offer. Most of the firms granted discounts to customers who purchased in large quantities. More than 82 percent of the surveyed nurseries sold less than 100 percent of their sales at the printed price value. The nurserymen were not asked to estimate the proportion of their total sales that were made at discounted levels.

Less than 10,000 dollars: Of the nurseries with gross sales in this range, many did not advertise at all. Only 12 percent of these nurseries used mass media and 12 percent used private advertising. Of the nurseries using mass media, an average of 49 percent of their advertising budget was spent on this method. Nurseries using private advertising spent 44 percent of the advertising budget for these wholesale catalogs. Only 6 percent of the nurseries advertised in trade journals or attended trade shows, spending approximately 7 percent of their advertising budget on this media type.

Table 15. Distribution of Total Advertising Expenditure by Media Type, 90 Surveyed Nurseries, Tennessee, 1986.

	Annual Sales in Dollars											
	Less than 10,000		10,000-49,999		50,000-99,999		100,000-499,999		500,000-999,999		More than 1,000,000	
Media Type[a]	Firms	Ad$	Firms	Ad$	Firms	Ad$	Firms	Ad$	Firms	Ad$	Firms	Ad$
	percent											
Mass												
Radio, TV, Newspaper	12	49.0	10	3.3	0	0	6	7.7	0	0	7	0.3
Industrial												
Trade Shows, Journals	6	6.7	10	30.8	8	18.8	44	25.2	70	47.6	87	45.9
Private												
Wholesale Catalog (Price List)	12	44.3	25	65.8	33	81.3	75	67.2	100	52.4	100	53.7
Total		100.0		99.9[b]		100.1[b]		100.1[b]		100.0		99.9[b]

[a] Firms may choose more than one media type

[b] Does not equal to 100.0 due to rounding error

10,000-49,999 dollars: The most popular advertising method among nurseries in this group was private advertising. Twenty-five percent of these nureries utilized private advertising with an average of nearly 66 percent of their advertising budget spent on this method. Mass media and industrial advertising were not used heavily, as only 10 percent of the nurseries used these types. Trade shows and journals, however, commanded a higher expense as evidenced by the 31 percent of the advertising budget compared to only 3 percent for radio, television, and newspaper.

50,000-99,999 dollars: Private advertising (catalogs) was used by one-third of the nurseries in this group, with an expenditure of 81 percent of the advertising budget. Only 8 percent of the nurseries in this sales group participated in trade shows or advertised in trade journals. Those that did participate in trade shows spent an average of nearly 19 percent of their advertising budget. None of the nurseries utilized mass media advertising.

100,000-499,999 dollars: Seventy-five percent of the nurseries in this category used private advertising and spent an average of 67 percent of the advertising budget on this method. Forty-four percent of the nurseries used industrial advertising while spending an average of 25 percent of the advertising budget on this method. Only 6 percent utilized mass media with these nurseries spending 8 percent of the budget on this method.

500,000-999,999 dollars: There were only two methods of advertising used by these firms: private and/or industrial advertising. Private advertising was used by all of the firms in this category,

whereas 70 percent utilized industrial advertising. Private advertising, however was more expensive as 52 percent of the firms' advertising budget was spent on this method compared to 48 percent on industrial advertising.

More than 1,000,000 dollars: All three forms of advertising was used by some of these firms. Mass media advertising was used by only 7 percent of these nurseries, spending an average of less than one percent of the advertising budget. Private advertising was the most important method as all of these nurseries used this type. An average of 53 percent of the advertising budget was spent on this method compared to 46 percent on industrial advertising.

Transportation

Truck shipment was the most commonly used method of transporting nursery stock (Table 16). Of the 90 nurserymen surveyed, 89 percent used rented/consigned trucks and customer pick-up, whereas 64 percent shipped in their own trucks. Parcel post was used by 27 percent of the nurseries. Overall, 23 percent of total sales in 1986 was shipped by nursery owned trucks, 66 percent was shipped by rented or consigned vehicles and customer pick-up, and 11 percent was shipped by parcel post.

Nurseries with less than 100,000 dollars in annual sales tend to rely more heavily on shipping by nursery-owned trucks and less on parcel post. Larger nurseries with at least 100,000 dollars in sales relied heavily on rented or consigned trucks.

Table 16. Number of Nurseries and Percentages of Total Sales Shipped by Various Methods, 90 Surveyed Nurseries, Tennessee, 1986

Annual Sales In Dollars	Nurseries in survey number	Transportation Method: Own Trucks Nurseries percent	Own Trucks Share of Sales percent	Parcel Post Nurseries percent	Parcel Post Share of Sales percent	Other[a] Nurseries percent	Other[a] Share of Sales percent	Total Sales percent
Less than 10,000	17	59	43.2	6	1.0	76	55.8	100.0
10,000-49,999	20	70	41.3	5	b	85	58.7	100.0
50,000-99,999	12	75	50.2	8	6.5	83	43.3	100.0
100,000-499,999	16	75	25.9	31	11.1	94	63.0	100.0
500,000-999,999	10	50	16.2	80	17.3	100	66.4	99.9[c]
More than 1,000,000	15	53	22.9	53	9.3	100	67.8	100.0
Total	90	64	22.8	27	10.7	89	66.4	99.9[c]

[a] Includes rented/consigned trucks, customer pickup, and buyer furnishing trucks

[b] Less than .1 percent

[c] Does not equal to 100.0 due to rounding error

Parcel post was utilized more extensively by nurseries in the 500,000-999,999 dollars sales group with 17.3 percent of their sales shipped by this method. Parcel post was used the least by nurseries in the 10,000-49,999 dollars sales group with less than .1 percent transported. Nurseries in the 50,000-99,999 dollars sales group shipped nursery stock in their own trucks more often than the other nursery groups, with 50 percent of their sales shipped by this method.

Pricing

Among the surveyed nurseries, four ways were identified that a price may be set: competitive pricing, pricing according to quality, pricing according to production costs, and other unique pricing methods referred to as the firm's own rule-of-thumb (Table 17). Competitive pricing was identified as the most important method of establishing a price by 34 percent of all nurseries, followed by quality pricing (29 percent), pricing based on cost of production (23 percent), and rule-of-thumb pricing (13 percent). Competitive pricing appears to be more extensively utilized among firms with less than 10,000 dollars in annual sales (53 percent), while the cost of production and rule-of-thumb pricing are used the least (12 percent each). Interestingly, competitive pricing and rule-of-thumb pricing were utilized less than the other two methods among firms with annual gross sales of more than 1,000,000 dollars. Price based on cost of production was selected as the most important among these large firms. There appears to be a trend that as a firm's sales become larger, prices based on cost of production become relatively more important, and competitive pricing less important.

Table 17. Methods Identified by Nurserymen as the Most Important in Determining Product Prices by Annual Sales, 90 Surveyed Nurseries, Tennessee, 1986.

Annual Sales in Dollars	Pricing Method									
	Competitive Pricing		Quality Pricing		Cost of Production		Rule of Thumb		Total	
	Firms	Percent	Firms	Percent	Firms	Percent	Firms	Percent	Firms	Percent
Less than 10,000	9	52.9	4	23.5	2	11.8	2	11.8	17	100.0
10,000-49,999	8	40.0	5	25.0	5	25.0	2	10.0	20	100.0
50,000-99,999	2	16.7	7	58.3	2	16.7	1	8.3	12	100.0
100,000-499,999	7	43.8	4	25.0	3	18.8	2	12.5	16	100.1[a]
500,000-999,999	2	20.0	2	20.0	4	40.0	2	20.0	10	100.0
More than 1,000,000	3	20.0	4	26.7	5	33.3	3	20.0	15	100.0

[a]Does not equal to 100.0 due to rounding error

Table 18 presents the price determination methods used by the surveyed nurseries when grouped by size. Among the small-acreage nurseries, competitive pricing was utilized by 40 percent of these firms and rule-of-thumb pricing by 13 percent. Quality and competition were each reported as a pricing method by 33 percent of the medium-sized nurseries. Again, rule-of-thumb pricing was not a dominant method. The large nurseries varied in their pricing decisions. Competitive pricing was selected as the most important method by 30 percent of these large nurseries, but was closely followed by cost of production pricing (27 percent), quality pricing (23 percent), and rule-of-thumb pricing (20 percent). Perhaps, one reason for the wide difference among pricing preferences of the small versus the large nurseries is that smaller firms are usually younger. Hence, to capture a share of the market they offer prices on a competitive basis. The larger firms are established operations with substantial machinery and equipment. These larger firms are capital extensive and conscious of their production costs, therefore they are more likely to offer prices based on the competition and production costs.

Negotiation between the wholesalers and their customers was common within the industry. Factors such as price, delivery, quality of goods, quantity, and reputation of the participants are important variables for successful negotiation. For the purposes here, price was the variable to be examined. Small wholesalers received their printed price value 83 percent of the time. On average, the medium-sized wholesalers received their printed price value 76 percent of the time and large wholesalers 63 percent of the time.

Table 18. Methods Identified by Nurserymen as the Most Important in Determining Product Prices, by Nursery Size, 90 Surveyed Nurseries, Tennessee, 1986

Nursery Size[a]	Competitive Pricing		Quality Pricing		Cost of Production		Rule of Thumb		Total	
	Firms	Percent	Firms	Percent	Firms	Percent	Firms	Percent	Firms	Percent
Small	12	40.0	9	30.0	5	16.7	4	13.3	30	100.0
Medium	10	33.3	10	33.3	8	26.7	2	6.7	30	100.0
Large	9	30.0	7	23.3	8	26.7	6	20.0	30	100.0
Chi Square 3.83[b]										

[a]Small 0.0-9.9 acres; Medium 10.0-99.9 acres; Large 100.0 acres or more

[b]Not statistically significant at the .05 level

Repeat sales were important to the nursery industry. A high rate of repeat purchases means that customers are satisfied with the services being offered. Small nurseries report a repeat sales figure of 86 percent. Medium and large nurseries reported repeat sales figures of 87 and 85 percent, respectively.

A chi-square test was performed on these four pricing mechanisms to see if there were any significant difference among the nursery sizes. The null hypothesis states that the three nursery groups, small, medium, and large, use the four methods of determining product prices in the same proportions. The alternative hypothesis is that the nusery groups do not use the various pricing methods in the same proportions. The chi-square statistic was 3.83 which is not significant at the .05 level. This suggests that the evidence does not allow rejection of the hypothesis that different nursery sizes use the methods of determining product prices in the same proportions. That is, methods of determining product prices do not vary significantly among the different nursery sizes.

III. DESTINATIONS OF TENNESSEE PRODUCED NURSERY STOCK

Major Leading Areas

Table 19 presents the destinations of nursery stock sold by Tennessee nurserymen in the survey sample. A comparison was made with an earlier study conducted in 1980 to reveal any adjustments in shipping patterns (Badenhop, 1980). In terms of annual gross sales in 1986, nearly 63 percent of the woody ornamentals sold by the surveyed nurserymen were shipped to buyers in the South geographic region, 36 percent in

Table 19. Percentage of Gross Sales of Woody Ornamentals Shipped by Tennessee Wholesalers to United States Geographic Regions, Divisions, and States, 1980 and 1986

Geographic regions, divisions, and states	Gross Sales			
	----------percent--------			
	1980[a]		1986[b]	
The North	43.3		36.3	
West North Central:	2.2		4.5	
Missouri		1.3		3.0
Iowa		0.1		0.1
Minnesota		0.1		0.4
Nebraska		0.1		0.4
Kansas		0.6		0.6
East North Cental:	29.4		15.1	
Illinois		5.9		5.4
Indiana		5.0		2.2
Michigan		7.6		2.4
Ohio		9.9		4.6
Wisconsin		1.0		0.5
Middle Atlantic:	9.6		14.7	
Pennsylvania		5.0		4.8
New York		2.4		5.6
New Jersey		2.2		4.3
New England:	2.1		2.0	
Massachusetts		1.5		1.0
Connecticut		0.6		1.0
Vermont		c		d
New Hampshire		c		d
Maine		c		d
The South	51.9		62.5	
West South Central:	9.4		5.8	
Texas		7.0		2.8
Oklahoma		0.6		1.0
Arkansas		1.6		1.7
Louisiana		0.2		0.3
East South Central:	21.6		24.0	
Tennessee		13.5		16.3
Kentucky		4.4		3.9
Alabama		3.2		2.8
Mississippi		0.5		1.0

(Continued)

Geographic regions, divisions and states	Gross sales					
	----------percent---------					
	1980			1986		
South Atlantic:		20.9			32.7	
Georgia			5.9			6.6
Florida			0.2			0.8
South Carolina			2.1			4.3
North Carolina			4.8			6.4
Virginia			3.8			6.8
West Virginia			0.7			1.1
Maryland and District of Columbia			3.4			6.7
Delaware			c			d
The West	1.9			0.42		
Mountain:		1.1			0.01	
Colorado			0.8			0
New Mexico			0.3			0.01
Utah			c			d
Pacific:		0.8			0.41	
California			0.6			0.2
Oregon			0.1			0.2
Washington			0.1			0.01
Other	2.9			0.78		
Foreign Countries:		0.8	0.8		0.1	0.1
Other States:		2.1[c]	2.1[c]		0.68[d]	0.68[d]
Total	100.0	100.0	100.0	100.0	100.0	100.0

[a] Source: Badenhop (1980)

[b] Source: 90 Surveyed Nurseries

[c] Shipments to these states and to destinations not identified total 2.1 percent of gross sales

[d] Shipments to these states and to destinations not identified total 0.68 percent of gross sales

the North geographic region, and less than one percent in the West region. In 1980, nearly 52 percent of woody ornamentals sold by the surveyed Tennessee nurserymen were shipped to buyers in the South geographic region, 43 percent in the North, and 2 percent in the West. Apparently, the proportion of total industry sales to the South region increased between 1980 and 1986, but shipments to the North region as a percentage of total sales declined.

The South as a region was divided into three divisions, termed West South Central, East South Central, and South Atlantic. The South Atlantic division, consisting of seven states and the District of Columbia, was the most important marketing division for Tennessee nursery products because it accounted for nearly 33 percent of annual gross sales. This was a major change from 1980 when this division accounted for 21 percent of gross sales. The five major states in this division, in descending order of importance with respect to their share of sales, were Virginia (6.8 percent), Maryland and the District of Columbia (6.7 percent), Georgia (6.6 percent), North Carolina (6.4 percent), and South Carolina (4.3 percent).

The East South Central division consisting of Tennessee, Kentucky, Alabama, and Mississippi, was the second most important marketing division for Tennessee nursery products. This division accounted for 24 percent of annual gross sales. This was a slight adjustment from 1980 as the figure for that year was 22 percent. Tennessee was the leading state in 1986 in this division with 16 percent of gross sales followed by Kentucky, Alabama, and Mississippi with 3.9 percent, 2.8 percent, and 1.0 percent of gross sales, respectively.

The West South Central division experienced a sharp decline of 3.6 percentage points. Oklahoma, Arkansas, and Louisiana had slight increases from 1980, but Texas fell sharply from 7 percent in 1980 to 2.8 percent in 1986.

Sales in the North geographic region declined seven percentage points from 43.3 percent in 1980 to 36.3 percent in 1986. Perhaps the biggest reason was the East North Central division. In 1980, this division accounted for 29 percent of annual sales, but only 15 percent in 1986. The leading states in this division in 1986 in descending order of importance were Illinois (5.4 percent), Ohio (4.6 percent), Michigan (2.4 percent), and Indiana (2.2 percent). In 1980, the important states in this division were Ohio (9.9 percent), Michigan (7.6 percent), Illinois (5.9 percent), and Indiana (5.0 percent).

The Middle Atlantic division experienced an increase in share of sales from 9.6 percent in 1980 to 14.7 percent in 1986. Within this division, New York and New Jersey experienced an increase in share of sales of 3.2 percentage points and 2.1 percentage points, respectively. Pennsylvania remained about the same with 5 percent in 1980 compared to 4.8 percent in 1986.

The West North Central division had a 2.3 percent increase in share of sales between 1980 and 1986. In 1986, this division accounted for 4.5 percent of annual sales with Missouri contributing the majority of this total. The New England division experienced a slight decrease in share of sales between 1980 and 1986. Massachusetts and Connecticut were the leading states in this division.

The West geographic region in 1986, as in 1980, was not an important market region for Tennessee produced nursery stock. These six states in this region accounted for less than one percent of the total annual gross sales of the surveyed nurserymen.

Five states, including Tennessee, provided markets for nearly 43 percent of the value of nursery stock sold in 1986 by the certified nurseries interviewed. These states in descending order of importance were Tennessee, Virginia, Maryland (including the District of Columbia), Georgia, and North Carolina. In 1980, the five leading states in descending order of importance were Tennessee, Ohio, Michigan, Texas, and Illinois.

Channels of Distribution

Tennessee wholesalers distribute their nursery stock through various channels. All sales were assigned to three market outlets: wholesalers, retailers, and landscapers. Table 20 presents the distribution of sales by market outlet for firms within each of the six gross sales groups. It should be noted that these firms may distribute through one or more of the three channels, therefore the sum of percentages by sales groups do not equal 100.

Less than 10,000 dollars: Those firms within this sales group depended heavily on re-wholesalers for nearly 78 percent of their total wholesale sales (Table 20). Retail outlets and landscapers accounted for 12 percent and 11 percent of total wholesale sales, respectively, for these firms. On average, these nurseries received $2,121 from sales to other wholesalers and $317 and $298 from sales to retailers and landscapers, respectively (Table 21). Sixty-five percent of these

group shipped to retail outlets in 12 states with Tennessee accounting for 46 percent of sales to retailers, followed by Ohio and Kentucky with 19 percent and 15 percent, respectively. The distribution of sales to landscapers was spread among 13 states, with 59 percent accounted for by Tennessee. Kentucky was a distant second with 14 percent of sales to landscapers by the surveyed nurseries in this group.

50,000-99,999 dollars: Of the nurseries in this group, 92 percent sold to re-wholesalers with an equal number (58 percent) selling to both retailers and landscapers (Table 20). Sales to re-wholesalers accounted for 67 percent of total wholesale sales by nurseries in this group. Sales to retail outlets accounted for 17 percent of wholeale sales with landscapers accounting for 16 percent. On average, re-wholesale outlet sales accounted for $44,697 of total wholesale sales (Table 21). Retail and landscape sales accounted for $10,942 and $10,841, respectively, of wholesale sales.

Nurseries in this group shipped their products to re-wholesale outlets in 12 states (Table 24). The important market areas for this outlet were Tennessee, North Carolina, and Missouri with 74 percent, 7 percent, and 4 percent of wholesale sales, respectively. Sales to retailers were distributed among 9 states with Maryland, Kentucky, and Tennessee being the important states with 26 percent, 17 percent, and 16 percent of retail sales, respectively. Eight states were markets for sales to landscape firms with Tennessee being the most important with 43 percent of landscape sales followed by Kentucky and North Carolina with 23 percent and 13 percent, respectively.

Table 24. State Destinations of Wholesale Sales by Market Outlet, for Nurseries with Annual Gross Sales of 50,000-99,999 Dollars, Tennessee, 1986

State	Market Outlet					
	Wholesalers		Retailers		Landscapers	
	Firms	Sales	Firms	Sales	Firms	Sales
	percent					
Alabama	17	1.0	8	4.0	8	1.6
Georgia	8	0.5	8	4.0	8	1.6
Illinois	8	3.0	-	-	-	-
Indiana	8	2.2	-	-	-	-
Kentucky	17	3.5	25	16.8	17	22.5
Maryland	8	0.5	17	26.1	8	0.8
Michigan	-	-	8	6.7	-	-
Missouri	8	4.0	-	-	-	-
New Jersey	8	1.0	8	10.7	8	12.1
North Carolina	25	7.1	25	9.8	17	13.1
Ohio	8	0.8	8	6.2	8	5.7
Pennsylvania	8	2.2	-	-	-	-
Tennessee	83	74.1	25	15.7	50	42.6
Total		99.9[a]		100.0		100.0

[a]Does not equal to 100.0 due to rounding error

100,000-499,999 dollars: Among the nurseries in this sales group, sales to re-wholesalers accounted for 37 percent of wholesale sales with retail outlets accounting for 21 percent (Table 20). Forty-two percent of this group's wholesale sales were accounted for by landscapers. In addition, 94 percent of these nurseries sold to landscapers, which was the highest percentage of any of the groups for this market outlet. Eighty-one percent of these nurseries sold to other wholesalers and 75 percent to retail outlets. Landscape sales contributed an average of $85,845 per nursery with an additional $74,928 and $43,423 contributed by the wholesale and retail market outlets, respectively (Table 21).

Tennessee accounted for 21 percent of sales to re-wholesalers followed by Texas and New York with 10 percent each (Table 25). Retailers in 24 states and the District of Columbia purchased Tennessee produced nursery stock. Twenty-two percent of sales to this market outlet was accounted for by retailers in Tennessee, with Ohio and Georgia retailers accounting for 13 percent and 11 percent, respectively.

500,000-999,999 dollars: Re-wholesalers and retailers were utilized by all the nurseries in this group (Table 20). Seventy percent of these nurseries shipped to landscapers. Sales to re-wholesalers accounted for 54 percent of wholesale sales with landscapers and retail outlets accounting for 28 percent and 19 percent, respectively. Sales to re-wholesalers by nurseries in this group amounted to an average of $368,146, with landscapers and retailers receiving averages of $189,801 and $127,503 per nursery, respectively (Table 21).

Table 25. State Destinations of Wholesales Sales, by Market Outlet, for Nurseries with Annual Gross Sales of 100,000 - 499,999 Dollars, Tennessee, 1986

State	Market Outlet					
	Wholesalers		Retailers		Landscapers	
	Firms	Sales	Firms	Sales	Firms	Sales
	percent					
Alabama	19	2.0	31	1.6	25	2.7
Arkansas	6	0.1	13	1.0	13	1.0
Connecticut	6	2.7	--	---	--	---
Florida	6	0.1	13	0.5	6	0.5
Georgia	31	7.3	38	11.2	38	14.8
Illinois	13	4.0	19	0.8	19	1.4
Indiana	6	2.2	19	2.9	19	2.9
Kansas	--	---	--	---	6	b
Kentucky	13	1.7	31	7.7	44	10.5
Lousiana	6	0.1	13	0.5	13	1.0
Maryland	6	0.1	19	7.9	25	2.0
Michigan	13	3.0	6	0.2	6	0.5
Mississippi	6	0.1	25	1.4	19	2.4
Missouri	13	3.6	13	0.8	13	1.3
New Hampshire	6	0.3	6	0.1	6	0.2
New Jersey	6	7.8	13	4.4	6	0.5
New York	13	9.7	13	0.9	13	1.1
North Carolina	13	7.1	19	4.0	31	6.0
Ohio	25	7.3	19	13.2	25	4.7
Oklahoma	6	6.0	13	1.2	--	---
Pennsylvania	--	---	6	0.3	6	1.4
South Carolina	13	1.3	19	3.1	13	2.0
Tennessee	56	20.5	56	21.8	75	31.5
Texas	19	9.8	13	9.2	6	0.7
Virginia	13	1.9	31	3.2	31	5.6
West Virginia	6	1.2	13	1.3	13	1.7
Wisconsin	--	---	--	---	6	0.4
Dist. of Columbia	--	---	6	0.7	13	3.1
Total		99.9[a]		99.9[a]		99.9[a]

[a]Does not equal ot 100.0 due to rounding error

[b]Less than .1 percent

Re-wholesalers in 26 states and Canada purchased products from these nurseries (Table 26). Missouri was the most important rewholesaler market with 14 percent of re-wholesale sales, followed by Maryland and Tennessee with 13 percent and 12 percent, respectively. Tennessee was the most important state for sales to retailers with 21 percent of this group's sales to retailers. Missouri was second with 13 percent followed by Texas with 10 percent. Twenty-four states, the District of Columbia, and Canada were destinations for sales to landscapers. Tennessee was the most important state for this outlet with 16 percent of sales to landscapers, Missouri and Georgia accounted for 10 percent and 9 percent, respectively.

More than 1,000,000 dollars: Firms within this group depended heavily on retailers for 47 percent of their total wholesale sales (Table 20). Re-wholesalers and landscapers accounted for 27 percent and 25 percent, respectively, of wholesale sales of these firms. All of these nurseries in this group sold products to retailers, while the re-wholesalers and landscapers provided markets for 93 percent of the nurseries. On average, these nurseries received $795,973 from sales to retailers and $462,127 and $427,233 from sales to re-wholesalers and landscapers, respectively (Table 20).

Tennessee retailers accounted for 16 percent of this group's retail outlet sales (Table 27). Virginia was the next most important market area, accounting for 8 percent, followed by Georgia with 7 percent. Georgia was the leading destination state for re-wholesale markets with nearly 10 percent. Tennessee and Virginia were also important areas, each accounting for 9 percent of sales to re-wholesalers by these

Table 26. State Destinations of Wholesale Sales, by Market Outlet, for Nurseries with Annual Gross Sales of 500,000 - 999,999 Dollars, Tennessee, 1986

State	Market Outlet					
	Wholesalers		Retailers		Landscapers	
	Firms	Sales	Firms	Sales	Firms	Sales
	percent					
Alabama	50	3.3	40	5.4	40	8.4
Arkansas	10	0.7	10	1.2	10	1.6
Florida	20	1.2	20	0.8	20	1.4
Georgia	50	7.6	40	5.0	50	8.7
Illinois	20	1.2	30	1.4	30	1.0
Indiana	30	1.7	20	2.6	20	1.8
Kansas	10	0.5	20	1.4	20	2.6
Kentucky	20	2.1	50	5.8	40	4.8
Louisiana	20	0.5	--	---	--	---
Maryland	30	13.3	20	1.7	30	7.9
Massachusetts	10	0.9	10	0.6	10	0.2
Michigan	20	1.2	20	1.0	20	0.4
Mississippi	20	0.3	20	0.4	20	0.6
Missouri	30	13.8	40	13.4	40	9.8
Nebraska	10	0.2	--	---	--	---
New Jersey	60	7.0	30	3.7	40	4.9
New York	30	1.1	30	2.5	20	2.6
North Carolina	40	6.5	40	5.0	40	6.0
Ohio	40	3.4	40	3.9	40	5.3
Oklahoma	20	1.5	20	1.7	20	1.1
Pennsylvania	40	8.2	20	1.9	20	0.8
South Carolina	40	5.2	30	2.0	30	2.7
Tennessee	80	11.6	80	21.1	70	16.3
Texas	20	1.0	20	10.4	10	1.3
Virginia	50	5.0	50	4.6	50	6.6
West Virginia	20	0.9	30	1.4	30	1.8
District of Columbia	--	---	10	0.8	10	1.2
Canada	10	b	10	0.1	10	0.3
Total		99.9[a]		99.8[a]		100.1[a]

[a]Does not equal to 100.0 due to rounding error

[b]Less than .1 percent

Table 27. State Destinations of Wholesale Sales, by Market Outlet, for Nurseries with Annual Gross Sales of More than 1,000,000 Dollars, Tennessee, 1986

State	Market Outlet					
	Wholesalers		Retailers		Landscapers	
	Firms	Sales	Firms	Sales	Firms	Sales
	percent					
Alabama	13	1.7	47	3.2	13	1.9
Arkansas	13	1.8	27	2.5	7	0.3
California	13	1.8	7	0.2	7	0.3
Connecticut	27	4.3	13	0.4	7	0.2
Delaware	7	0.9	7	0.6	7	0.2
Florida	13	1.0	20	0.4	--	---
Georgia	47	9.8	67	7.0	47	5.9
Illinois	13	2.7	40	4.5	33	2.9
Indiana	7	1.3	27	2.2	20	2.6
Iowa	--	---	13	1.7	--	---
Kansas	7	0.2	7	0.5	7	0.9
Kentucky	13	1.1	60	6.2	40	6.7
Louisiana	7	0.9	7	0.2	--	---
Maine	7	0.4	7	0.1	7	0.2
Maryland	40	8.3	47	6.1	53	9.1
Massachusetts	13	2.6	7	0.7	13	1.9
Michigan	13	0.9	27	3.8	20	4.1
Minnesota	--	---	7	1.2	--	---
Mississippi	13	1.2	27	2.2	--	---
Missouri	--	---	13	1.3	7	1.4
Nebraska	--	---	7	1.2	--	---
New Hampshire	6	0.4	7	0.1	7	0.2
New Jersey	13	5.0	33	2.5	27	2.5
New York	27	6.0	40	3.9	40	6.1
North Carolina	27	6.1	53	5.9	27	3.5
Ohio	7	0.1	33	5.1	33	7.6
Oklahoma	13	2.0	7	0.2	7	0.7
Oregon	7	0.6	7	0.2	7	0.3
Pennsylvania	40	4.5	53	3.7	40	3.7
South Carolina	27	7.1	60	3.7	20	2.0
Tennessee	53	9.2	60	15.8	60	19.7
Texas	13	5.0	27	3.0	20	1.6
Virginia	33	8.8	60	7.5	40	10.7
Washington	7	1.2	--	---	--	---
West Virginia	7	0.4	27	1.6	13	1.1
Wisconsin	--	---	--	---	7	1.5
Wyoming	--	---	7	0.1	--	---
District of Columbia	13	2.6	13	0.3	7	0.2
Canada	7	0.2	7	0.1	7	0.1
Total		100.1[a]		99.9[a]		100.1[a]

[a]Does not equal to 100.0 due to rounding error

nurseries. Tennessee also received the largest percentage of sales to landscapers with 20 percent, followed by Virginia with 11 percent, and Maryland with 9 percent.

Origins of Seedlings and Liners

Most of the surveyed nurseries (83 percent) purchased seedlings and liners (Table 28). The origin of these purchased inputs included Tennessee, Canada, and 25 other states. However, with respect to value, 50 percent of seedlings and liners were purchased in Tennessee. Oregon was the next most important state after Tennessee with 41 percent of the nurseries making purchases from suppliers in that state. Oregon accounted for 16 percent of the total value of nursery stock purchased by the surveyed nurseries. Eight percent of the nursery stock was purchased from Washington, followed by Alabama and Pennsylvania with 4 percent each. These five leading states accounted for 82 percent of nursery stock purchased by the surveyed nurseries.

Table 28. State of Origin for Seedlings and Liners Purchased by Tennessee Nurseries, 1986

State	Nurseries Buying[a]		Share of Total Value
	number	percent	percent
Tennessee	61	81.3	50.0
Oregon	31	41.3	16.1
Washington	16	21.3	8.1
Alabama	20	26.7	4.1
Pennsylvania	20	26.7	4.1
North Carolina	9	12.0	2.5
California	10	13.3	2.1
Montana	7	9.3	2.0
New Jersey	5	6.7	1.8
Georgia	5	6.7	1.2
Iowa	1	1.3	1.1
Oklahoma	3	4.0	0.8
Maine	1	1.3	0.8
Kansas	4	5.3	0.7
Texas	5	6.7	0.7
Louisiana	3	4.0	0.5
Michigan	3	4.0	0.5
Mississippi	2	2.7	0.5
Ohio	3	4.0	0.5
Canada	2	2.7	0.4
Missouri	3	4.0	0.4
South Caroli	2	2.7	0.3
Florida	3	4.0	0.2
Delaware	1	1.3	0.2
Arkansas	1	1.3	0.2
Maryland	1	1.3	0.1
All States	75	83.3	99.9[b]

[a]15 nurseries did not purchase nursery stock

[b]Does not equal to 100.0 due to rounding error

IV. TRENDS AND PROBLEMS OF THE NURSERY INDUSTRY

Importance of Channel Members

Each nursery manager was asked to report the percentage of all liners and seedlings obtained from their top five suppliers and the percentage of sales accounted for by their top five buyers in each of the three market outlet categories. The intent of this question was to gain insight into the concept of channel leadership and the relative importance of each nursery's five largest trading partners. This data will not permit the calculation of a true concentration ratio since each firm could conceivably sell and/or purchase from a unique set of firms. However, the percentages will reveal the nursery's level of dependence upon a small number of suppliers and customers.

Five largest suppliers: The simple average of the percent of total purchases that each firm obtains from their five most important suppliers was 86 percent (Table 29). Smaller firms with less than

Table 29. Average Dependence on Five Largest Channel Members, 90 Surveyed Nurseries, Tennessee, 1986.

Annual Sales In Dollars	Channel Type: Five Largest Suppliers	Five Largest Wholesalers	Five Largest Retailers	Five Largest Landscapers
	percent			
Less than 10,000	92	98	96	96
10,000-49,999	98	90	79	82
50,000-99,999	94	100	81	77
100,000-499,999	78	69	70	63
500,000-999,999	77	30	47	24
More than 1,000,000	76	59	52	62
Average	86	72	67	67

$100,000 in sales purchased 92 to 98 percent of all liners and rooted cuttings from the five largest suppliers. Nurseries with $100,000 or more in sales purchased 76 to 78 percent of supplies from the five major suppliers. Hence, the smaller nurseries are more dependent on a few suppliers than the larger nurseries.

Five largest re-wholesalers: This category refers to percentages of sales that each nursery attributed to their five most important re-wholesale customers. The average dependence level of surveyed nurseries on these five re-wholesalers was 72 percent. The five-firm dependence level for this market outlet ranged from 30 percent for the $500,000-$999,999 in annual sales group to 100 percent for the $50,000-$99,999 sales group. Nurseries with less than $100,000 in total sales had a level of at least 90 percent, whereas, nurseries with annual sales greater than $100,000 had a dependence level of less than 70 percent.

Five largest retailers: The average percentage of sales to each firm's five major retail outlets was 67 percent. This dependence level had a range of 47 percent for the $500,000-$999,999 sales group to 96 percent for nurseries with less than $10,000. Nurseries with at least $100,000 in sales were not as dependent, on average, as their smaller competitors on a few buyers. Seventy percent was the highest dependence level which was accounted for by nurseries in the $100,000-$499,999 group.

Five largest landscapers: The average percentage of total sales of each firm to its five largest landscapers was 67 percent. The dependence level had a range of 24 percent for the $500,000-$999,999 sales group to 96 percent for the less than $10,000 group. Nurseries

with less than $100,000 in annual sales had a dependence level of at least 77 percent, whereas, nurseries with sales of greater than $100,000 had a dependence level of no higher than 63 percent.

Pattern of Shipment

The monthly nursery shipping pattern is illustrated by Table 30. The patterns among the six nursery groups was quite similar. March was the heaviest month for shipments for all six nursery groups, as it accounted for an average 30 percent of the total value of all shipments in 1986. April was the next most important month with respect to shipments, followed closely by February. The summer months of May through August were the slowest shipping months. The shipping season starts in September and ends in April. The peak shipping months logically coincide with the attainment of products by sellers in preparation for fall and spring plant sales.

Shipping Preparation

Table 31 presents the methods used in preparing woody ornamentals for shipment. Balled and burlapped was the most popular form of preparing plants, used by 50 percent of the surveyed nurseries. Twenty-three percent of the surveyed nurseries listed bare root as the most important method, followed by containers and liners with 10 percent and 9 percent, respectively. Only 6 percent of the nurseries selected rooted cuttings, and packaged or processed balls were selected as the most important shipping preparation method by only 2 percent of the nurseries.

Table 30. Monthly Pattern of Shipment of Nursery Stock, 90 Surveyed Nurseries, Tennessee, 1986

Month	Annual Sales in Dollars						
	Less than 10,000	10,000-49,999	50,000-99,999	100,000-499,999	500,000-999,999	More than 1,000,000	Average
	percent						
January	1.1	8.3	10.0	7.9	12.2	7.9	8.7
February	0.8	6.4	8.2	10.6	14.5	13.6	13.3
March	21.9	14.8	23.6	30.4	27.1	31.6	30.2
April	10.2	12.9	14.5	16.6	14.9	18.1	17.2
May	1.6	6.3	6.6	9.0	5.8	4.4	5.0
June	a	2.7	-	2.3	0.8	1.3	1.3
July	1.5	6.6	-	1.4	-	1.0	0.9
August	a	6.6	-	0.5	1.7	0.9	1.1
September	7.4	5.8	1.9	1.2	1.7	2.1	2.0
October	16.3	6.6	9.5	5.6	4.9	6.8	6.4
November	23.7	13.8	13.5	11.0	8.3	7.5	8.2
December	15.4	9.3	12.3	3.6	7.9	4.7	5.4
Total	99.9[b]	100.1[b]	100.1[b]	100.1[b]	99.8[b]	99.9[b]	99.7[b]

[a]Less than .1 percent

[b]Does not equal to 100.0 due to rounding error

Table 31. Methods Used in Preparing Woody Ornamentals for Shipment, 90 Surveyed Nurseries, Tennessee, 1986.

Nursery[a] Size	Method Reported as Most Important						
	Balled and Burlapped	Bare Root	Containers	Liners	Rooted Cuttings	Packaged or Processed	Total
Small	11.1	8.9	5.6	4.4	3.3	---	33.3
Medium	17.8	10.0	2.2	2.2	1.1	---	33.3
Large	21.1	4.4	2.2	2.2	1.1	2.2	33.2
Total	50.0	23.3	10.0	8.8	5.5	2.2	99.8[b]

[a]Small 0.0 - 9.9 acres, Medium 10.0 - 99.9 acres, Large 100.0 or more acres

[b]Does not equal 100.0 due to rounding error

Business Expansion

Approximately 75 percent of the nurseries have goals of expanding their operations in the near future (Table 32). All of the nurseries in the largest sales group reported a desire to expand in the future. The percentage of negative response was inversely related with the size of nurseries in terms of annual sales.

Table 32. Nurseries with Goals of Expanding, 90 Surveyed Nurseries, Tennessee, 1986.

Annual Sales in Dollars	Plan to Expand			
	Yes	No	Yes	No
	number		percent	
Less than 10,000	10	7	11.1	7.8
10,000-49,999	15	5	16.7	5.6
50,000-99,999	7	5	7.8	5.6
100,000-499,999	12	4	13.3	4.4
500,000-999,999	8	2	8.9	2.2
More than 1,000,000	15	0	16.7	-
Total	67	23	74.5	25.6

The nurseries that planned to expand in the future were asked to specify the major factor that they perceived as limiting expansion.

Among the problems noted, a shortage of labor was listed as the most serious problem of the nursery industry by 49 percent of all surveyed nurseries (Table 33). Insufficient capital was the major problem identified by 21 percent of the surveyed nurseries, inconsistent market demand was selected by 7 percent of the nurseries, and the unavailability of land by 6 percent. Other problems such as weather hazards, pests and diseases, and management inefficiency was listed by 18 percent.

Table 33. Factors Reported by Nurserymen as the Major Limitation to Expansion, 90 Surveyed Nurseries, Tennessee, 1986.

Annual Sales In Dollars	Major Limitations Reported				
	Labor	Capital	Market Demand	Land	Other[a]
	percent				
Less than 10,000	5.8	5.8	-	-	7.0
10,000-49,999	12.8	4.7	1.2	1.2	-
50,000-99,999	5.8	1.2	1.2	2.3	3.5
100,000-499,999	10.5	4.7	-	1.2	3.5
500,000-999,999	5.8	-	2.3	1.2	1.2
More than 1,000,000	8.1	4.7	2.3	-	2.3
Total[b]	48.8	21.1	7.0	5.9	17.5

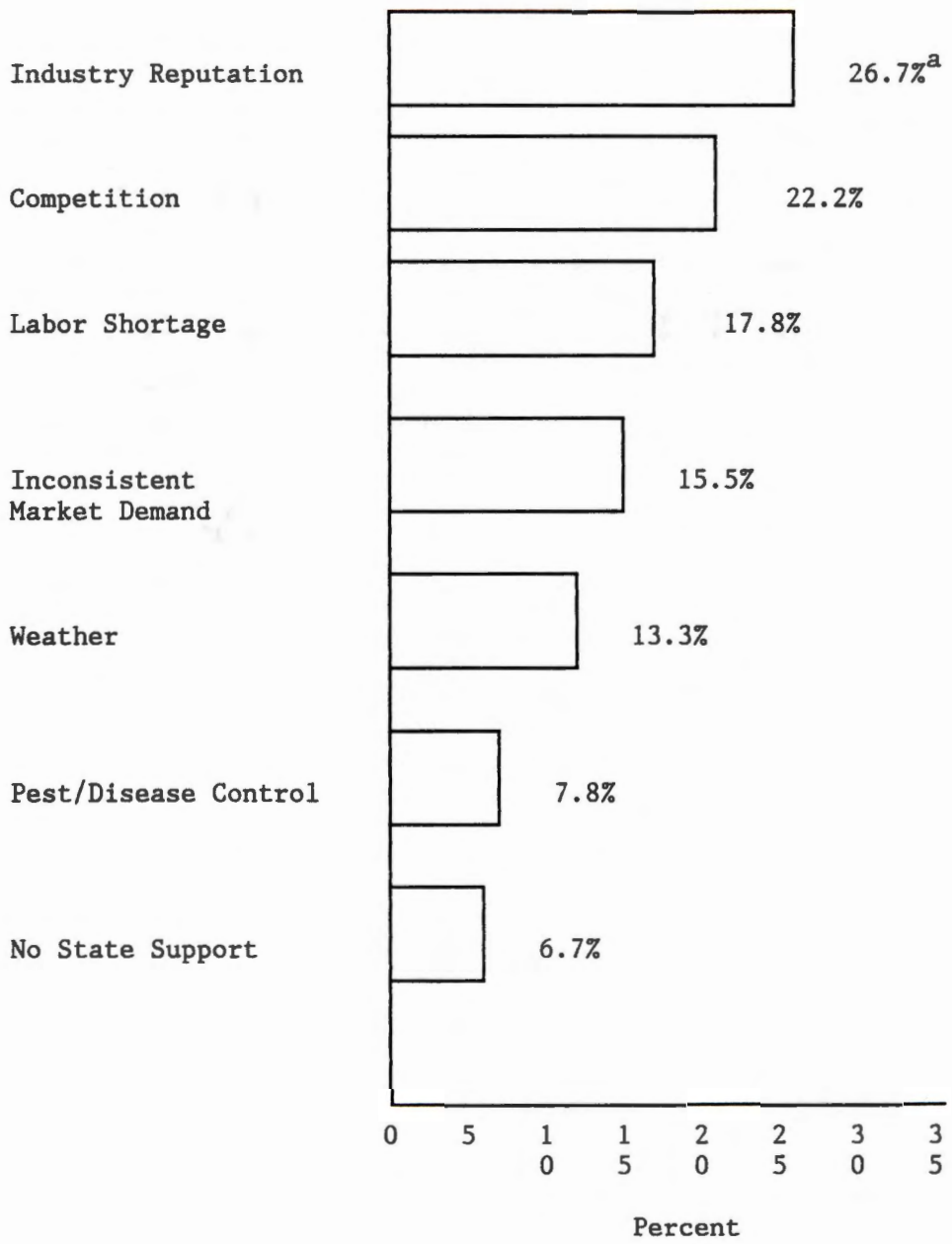
[a]Includes weather hazards, pests and diseases, and management inefficiency.

[b]Four nurseries did not respond.

Problems of the Nursery Industry

All participants in the survey were asked to list three major problems they felt were detrimental to the Tennessee nursery industry.

Surprisingly, nearly 27 percent noted the "bad" Tennessee reputation as one of the problems (Figure 4). Competition among the nurseries was selected by 22 percent of the nurseries, followed by labor shortage with 18 percent. Also listed were inconsistent market demand (16 percent), weather hazards (13 percent), pests and disease control (8 percent), and insufficient state support (7 percent).



[a]Total will sum to more than 100.0 percent since nurserymen were asked to list three items.

Figure 4. Major Problems Confronting the Nursery Industry, 90 Surveyed Nurseries, Tennessee, 1986

CHAPTER V

SUMMARY OF RESULTS

Marketing information from 90 wholesale nurseries located in Tennessee was presented in this report. The data pertained to the 1986 operating year. This study was designed to collect data that would describe the Tennessee horticultural industry and measure some of the existing marketing practices utilized by the wholesalers. A survey questionnaire was administered by the researcher to 90 randomly selected nurseries within the state of Tennessee. The specific objectives of the study were to:

1) identify the procurement and marketing patterns of Tennessee wholesale nurseries, and

2) analyze the current trade flows in order to consider the potential for, and the future direction of growth of the Tennessee nursery industry.

Most of the surveyed questions dealt with the sources of liners and seedlings and the destinations and market outlets for Tennessee produced nursery stock. Procurement information was required to determine purchases of liners and seedlings by state of origin, importance of the firm's largest suppliers, and data regarding purchases versus propagation. Marketing patterns were examined from information relating plant sales by type of purchaser, sales by state, and sales to the firm's five largest trading partners. The firm's advertising methods were also examined.

Several questions provided insight regarding transportation methods. Nursery responses were examined to reveal shipping methods and the amount of nursery stock shipped by each of these methods.

Nursery Characteristics

Fifty-eight percent of the surveyed firms began selling nursery stock since 1970, with 42 percent established prior to 1970. Thirty-seven percent of the small nurseries (less than 10.0 acres) were established prior to 1970, as were 27 percent of the medium nurseries (10.0-99.9 acres). Sixty-three percent of the large nurseries (100.0 acres or more) were established prior to 1970.

Many of the nurseries in the sample were individual ownerships, about 62 percent. Partnerships and corporations each accounted for 19 percent of the surveyed nurseries. Corporations however, accounted for 55 percent of the total annual sales of all firms, proprietorships 33 percent and partnerships the remaining 12 percent.

Marketing Practices

Deciduous shade trees accounted for 32 percent of total gross sales of all nursery products sold by the surveyed Tennessee nursery wholesalers. Deciduous ornamental trees (17 percent) were the next most important, followed by fruit trees (13 percent), evergreen trees (11 percent), and deciduous shrubs (10 percent).

Only 54 percent of the surveyed nurserymen used some method of advertising. Private advertising, or distribution of wholesale catalogs was the most common method, particularly among the largest firms. Also, more funds were allocated to private advertising than any other type of advertising expenditure.

Personal delivery was provided by 64 percent of the surveyed nurserymen. The most common method of transporting nursery stock was the utilization of rented/consigned trucks and customer pick-up (89 percent of firms). Parcel post was utilized by only 27 percent of the nurseries.

Four unique methods of price determination were identified as being used by the surveyed nurseries: competitive pricing, pricing according to production costs, pricing according to quality, and the firm's own rule-of-thumb pricing method. The methods of determining product prices did not appear to have any significant differences among the different nursery sizes.

Market Regions

The results show that over 40 states, the District of Columbia, and Canada provided market outlets for nursery products sold by Tennessee wholesalers. Sixty-three percent of the total value of nursery products produced was sold in the South, as compared to 36 percent in the North, with less than one percent each in the West and foreign countries/other states. Compared to a similar study by Badenhop in 1980, sales in the South increased 11 percentage points, whereas sales in the North region decreased 7 percentage points from the 1980 level. The West region also experienced a decline from 1980. Tennessee buyers were on the purchasing end of 16 percent of total gross sales. Other leading states in descending order of receiving nursery shipments from the surveyed nurseries were Virginia, Maryland (includes the District of Columbia), Georgia, and North Carolina. These states, with the exception of Maryland, border Tennessee further emphasizing the importance of the southern states for market outlets.

Tennessee wholesalers distribute their nursery stock through various channels. Of the 90 nurseries surveyed, sales to retailers accounted for 37 percent of the total value of nursery stock, as compared to 36 percent from re-wholesalers and 27 percent from landscapers. Approximately 86 percent of the surveyed nurseries sold to re-wholesalers, whereas the retail and landscape outlets were important customers for 69 percent of the firms.

Most of the nurseries in the survey sold a substantial share of their products to a relatively small number of their trading partners. The smaller firms were even more dependent than the larger nurseries on the five most important customers. The power of one channel member over another is related to the dependence one has for the other. On average, the five largest re-wholesalers accounted for 72 percent of annual wholesale sales of the surveyed nurseries. The five largest retail outlets and the five largest landscaping firms each accounted for 67 percent of total wholesale sales by the surveyed nurseries.

Tennessee growers were the most important source of liners and seedlings, followed by Oregon, Washington, Alabama, and Pennsylvania. These five states accounted for 82 percent of nursery stock purchased by the surveyed nurseries.

Trends and Problems

March was the busiest month for shipments from the surveyed nurseries, followed by April and February. Balled and burlapped was the most likely form of preparing woody ornamentals for shipment, followed by bare root and containers.

Seventy-five percent of the surveyed nurseries had plans of expanding their businesses. As the gross sales of a nursery became larger, the greater the likelihood of that nursery expanding was greater. Many problems were identified by the surveyed nurserymen which they perceived would limit their goals of expanding. Shortage of labor (49 percent of firms) was the most frequently identified problem, followed by insufficient capital (21 percent), and inconsistent market demand (7 percent).

The economic and marketing results provided by this survey revealed that the horticultural industry in Tennessee is quite diverse and dynamic. Further research is needed to address the specifics of the marketing environment of the nursery industry. Data regarding the specific varieties of plants being marketed, costs of production, transportation cost per load, size of shipments, and advertising budgets will be needed to examine the future potential of this sector of the agricultural economy. This type of insight can help nurserymen evaluate their plans regarding future production and marketing activities.

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APPENDIXES

APPENDIX A

University of Tennessee Insititute of Agriculture

1. When was the firm established?

Prior to 1950 _____
1950 - 1959 _____
1960 - 1969 _____
1970 - 1979 _____
1980 - present _____

2. How would the firm be best described?

Proprietorship _____
Partnership _____
Corporation _____ Type of corporation _____
Other? _____ (specify)

3. Are you affiliated with any of the following organizations? (check)

Tennessee Nurseryman's Assoc. _____
American Nurseryman's Assoc. _____
Southern Nurseryman's Assoc. _____
East TN Horticultural and Landscape Assoc. _____
Middle TN Nurseryman's Assoc. _____
West TN Nurseryman's Assoc. _____
Upper E.TN Christmas Tree and Shrubbery Growers Assoc. _____
Other (Please list) _____

4. What type of advertising do you use?
(check)

(a) _____Radio, TV, Newspaper

(b) _____Trade journals or papers

(c) _____Price lists (catalogs): how many per year? _____

(d) Percent of advertising budget allocated to:

Radio, TV, Newspaper _____

Trade Journals _____

Price Lists (Catalogs) _____
100%

5. Does your business operate a nursery in another state? ___yes ___no

If yes, where? _____ acreage _____

6. Do you export nursery products? _____yes _____no

7. Percent of total sales shipped to various states (or countries).

State	Percent	State	Percent	State	Percent
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
					100%

8. For the last fiscal year, what was your pattern of shipments of sales?

January	_____%	May	_____%	September	_____%
February	_____%	June	_____%	October	_____%
March	_____%	July	_____%	November	_____%
April	_____%	August	_____%	December	_____%
					100%

9a. From what states are seedlings or liners purchased?

State	Percent of total value	Number of suppliers	State	Percent of total value	Number of suppliers
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

9b. Percentage of total purchases from 5 largest suppliers? _____%
10 largest suppliers? _____%

10. Percentage of total sales: wholesale _____% retail _____% = 100%

11. If retail, what type of retail outlet?

Retail sales at nursery _____yes _____no

Retail sales at separate location _____yes _____no

Explain _____

_____

12. Percent of wholesale sales to:

other growers _____%

wholesale handlers _____%

retail outlets _____%

landscapers _____%

100%

13a. For sales to other growers, what is the destination by state?

State	Percent	State	Percent	State	Percent
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

100%

13b. Percent of total grower sales accounted for by the five largest growers. _____%

14a. If wholesale handlers, what is the destination by state?

State	Percent	State	Percent	State	Percent
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

100%

14b. Percent of total to five largest wholesale customers _____%

15a. If retail outlets, what is the destination by state?

State	Percent	State	Percent	State	Percent
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
					100%

15b. Percent of total 5 largest retail customers _____%

16a. For sales to landscapers, what is the destination by state?

State	Percent	State	Percent	State	Percent
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

16b. Percent of total to 5 largest landscapers _____%

17. List by rank of importance how your prices are determined.
1: most important, 4: least important

cost of production _____
comparison to other growers _____
by rule of thumb _____
by grade of plants _____

18. How frequently do you adjust your formal price list? _____

19. What percent of your total sales in 1986 were at the printed price value? _____%

20. What percent of your total sales last year were to repeat customers? _____%

21. What percentage of your sales in 1986 were in these product categories?

Deciduous Shade trees _____% Deciduous shrubs _____%

Deciduous Ornamental trees _____% Roses _____%

Vines and ground cover _____% Evergreen trees _____%

Narrow-leaved shrubs _____% Foliage plants _____%

Broad leaved evergreen shrubs _____% Perennials _____%

100%

22. Of all plants sold by your firm, rank in order of importance:
1: most important, 6: least important

balled in burlap _____
bare root _____
liners _____
rooted cuttings _____
containers _____
packaged or processed balls _____

23. Currently, what are the six most demanded products from your operation?

_____ _____

_____ _____

_____ _____

24. What percent of orders are received by:

mail _____%

phone _____%

in person _____%
Total 100%

25. Does your business offer delivery? yes _____ no _____

26. Do you have your own delivery trucks? yes _____ no _____

27. If shipped by truck, what type do you use?

a. common carriers _____yes _____no

b. nursery owned _____yes _____no

c. rented or consigned trucks _____yes _____no

28. If you deliver, what percentage of total sales does your firm deliver? _____%

29. When making deliveries what percentage of the return trips are empty backhauls? _____%

30. Do you use rail express? yes _____ no _____

31. If yes, what percentage of your stock is shipped by rail express? _____%

32. Do you use parcel post? yes _____ no _____

33. If yes, what percentage of your stock is shipped by parcel post? _____%

34. Do you use rail freight? yes _____ no _____

35. If yes, what percentage of your stock is shipped by rail freight? _____%

36. Do you plan to expand in the next few years? yes _____ no _____

37. What is your firm's most pressing limitation? Rank 1-5 (1 = most pressing limitation, 6 = least pressing limitation)

Labor _____
Capital _____
Market demand _____
Land _____
Interfirm conflict _____
other (specify) _____

38. In your opinion what are the three most serious problems of the Tennessee woody ornamental industry?

1. _____

2. _____

3. _____

39. Approximately what is the size of your firms labor force?
Permanent year-round employees _____
Temporary employees _____

40. Do you have salesmen on your payroll that travel and represent your firm?
yes ___ no___ If yes, how many? _____

41. Do you use the services of a sales broker? yes ____ no ____
If yes, where is the broker's headquarters? _____

42. In round numbers, what was the value of gross sales from this nursery in 1986? _____

APPENDIX B

Acreage in Certified Nursery Stock, 67 Counties, Tennessee 1985-1986[a]

County	Acreage	County	Acreage
Anderson	5.51	Loudon	.01
Bedford	10.00	McNairy	.10
Bledsoe	74.00	Macon	1.20
Blount	57.51	Madison	2.10
Bradley	46.00	Marion	1.00
Campbell	3.50	Marshall	5.00
Cannon	2.00	Maury	.20
Carroll	.04	Monroe	430.00
Carter	423.51	Montgomery	6.00
Cocke	86.25	Moore	.10
Coffee	1034.25	Morgan	105.26
Crockett	19.26	Obion	650.01
Cumberland	10.00	Polk	4.00
Davidson	41.63	Putnam	70.76
Dekalb	1935.79	Rhea	7.25
Dickson	11.26	Roane	67.01
Fayette	17.02	Robertson	31.00
Franklin	2110.00	Rutherford	111.90
Gibson	.02	Sequatchie	205.50
Giles	.10	Sevier	1.51
Greene	6.00	Shelby	1147.02
Grundy	1144.32	Sullivan	25.50
Hamblen	1.00	Sumner	210.20
Hamilton	42.87	Tipton	.01
Hardeman	.01	Trousdale	12.00
Hardin	9.12	Unicoi	8.25
Hawkins	4.25	Van Burren	146.00
Haywood	.12	Warren	15490.74
Henderson	2.02	Washington	23.10
Jefferson	1.00	Weakley	5.03
Johnson	164.75	White	32.51
Knox	91.85	Williamson	418.50
Lawrence	7.75	Wilson	12.00
Lincoln	75.00		
Total	26668.48		

[a]28 counties did not report any certified nursery acreage

VITA

Harry Dott Bryan, Jr was born in Lynchburg, Virginia, on August 2, 1964 to Harry and Laura Bryan. He attended school in Wartburg, Tennessee, Maryville, Tennessee, and Knoxville, Tennessee. He was graduated from Karns High School in June, 1982 and entered the University of Tennessee in September, 1982.

He received a Bachelor of Science Degree in Agriculture with a major in Agricultural Business in June of 1986. Upon graduation he was named the most outstanding senior in the Department of Agricultural Economics and Rural Sociology.

In June of 1986 he accepted a research assistantship from the Department of Agricultural Economics and Rural Sociology and began graduate studies at the University of Tennessee, Knoxville. He completed the requirements for a Master of Science Degree in December of 1988.

He is married to the former April Renay Moore of Wartburg, Tennessee.