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A DESCRIPTIVE SURVEY OF A SELECT POPULATION OF COMMERCIAL FRUIT AND VEGETABLE PRODUCERS IN TENNESSEE

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Linda Lee Brenchley

May 1990

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Thesis
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DEDICATION

To Billy, who said that I couldn't,

and to Robert, who never doubted that I could.

Thanks.

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My sincere thanks goes to Dr. John R. Brooker for his unending patience, guidance, understanding, and friendship.

Appreciation is also expressed to Dr. David B. Eastwood and Dr. S. Darrell Mundy for serving on my committee, and, for their encouragement and constructive criticism.

To those students, staff, and faculty members who were the source of much laughter, continuous encouragement, and diverse knowledge - thanks.

I would also like to thank the commercial fruit and vegetable producers and the extension agents in the Tennessee counties of Bledsoe, Coffee, Franklin, Grundy, Marion, Sequatchie, and Warren for a memorable and an educational summer. Without the cooperation of these individuals, this study would have been impossible.

ABSTRACT

Marketing is an integral part of a successful commercial produce enterprise. It also represents a significant challenge to the producers in this industry. Basic information regarding current production and marketing channels is needed by producers and other industry participants to make better use of existing resources and to provide a basis for beneficial change. Knowledge of background details is required to facilitate the marketing process. These details include grower population, types and amounts of production, methods of risk management, grading and standardization procedures, and market outlets used.

This study examined the market structure of the commercial produce industry in a selected study area of Tennessee. Emphasis was placed on the supply-side of the market. Specific objectives were to 1) identify the population of commercial fruit and vegetable growers in the study area, 2) ascertain the diversity and extent of production, 3) analyze producer behavior regarding standardization and grading, market outlets and information, and risk management, and 4) analyze the performance of existing packing facilities and market outlets.

The study area encompassed the Tennessee counties of Bledsoe, Coffee, Franklin, Grundy, Marion, Sequatchie, Van Buren, and Warren. The extension agent of each of county furnished a list of the commercial fruit and vegetable producers in his/her county. From this population, a random sample was drawn for the purpose of conducting a survey. Each grower in the random sample was interviewed personally. The data collected from this survey was coded and entered into a spreadsheet in Lotus 1-2-3. The

coded data was transferred to SAS for statistical analysis. A description of the supply-side of the commercial produce market in the study area was derived from the results of this analysis.

In identifying the producer population in the study area, several distinguishing characteristics were observed. These commercial fruit and vegetable growers either received nearly all of their household income or a small amount of their household income from farming. Few of the growers interviewed were in the realm between these two extremes. Nearly 30 percent of the producers surveyed worked at least 40 hours a week at jobs off the farm.

Over one-half of the producers derived 100 percent of their total 1986 farm incomes entirely from their produce enterprises. The majority of the 38 growers received none of their total 1986 farm income from crops other than produce.

Half of the surveyed growers have over 25 years of farming experience. Seventy-five percent have been farming for more than fifteen years. Nearly 70 percent of the producers interviewed were between the ages of 30 and 60 years old. Over 40 percent of the growers did not finish high school.

Over 70 percent of the farm operators said that at least one other family member was involved with their commercial produce enterprise. Sixty percent hired non-family labor which was used primarily in the harvesting stage of production.

Based on the sample of growers interviewed, a wide range of both fruits and vegetables was grown in the study area in both 1986 and 1987. Each producer grew either fruits or vegetables, but not both. Vegetables

grown included bell peppers, cabbage, cantaloupe, cucumbers, Indian corn, Irish potatoes, okra, pimento peppers, pumpkins, snapbeans, squash, sweet corn, sweet potatoes, tomatoes, and watermelons. Fruits grown were apples, blueberries, cherries,grapes, nectarines, peaches, plums, raspberries, and strawberries.

Commercial production of fruits and vegetables in the study area was limited by nine different factors. The surveyed growers ranked these factors, naming weather as the most limiting factor. Other significant factors that limit commercial production were prices received, diseases, available labor, and insects. Of particular interest was that only five of the 38 agricultural producers interviewed named debt level as a factor limiting production.

Four methods of risk management were used by the growers who were surveyed -- spreading sales, enterprise diversification, obtaining market information, and production contracts.

Various approaches were used by the growers to prepare their produce for marketing. Only 21 percent of the producers conformed to U.S.D.A. grading standards. Just over a fourth used U.S.D.A. standards to size their produce.

Produce was channeled through at least twelve different market outlets. The growers who were surveyed sold to wholesalers in Atlanta, Knoxville, Nashville, and other regions. Retailer outlets in Chattanooga and other local areas were used, as well as farmers' markets in Atlanta, Chattanooga, and Nashville. Produce was also sold to processors and through other unspecified market outlets.

Producer reaction to prices offered by buyers was varied. The only producers who felt that they must accept the price offered by the buyer were those producers who dealt with wholesalers.

Many agricultural producers feel that they receive below-cost (or unfair) prices for their commodities. However, the majority of the growers who were surveyed felt that they had received fair prices for their most important crops.

The majority of the producers who were interviewed rated the quality of locally grown produce as superior to produce from other origins. The majority were also unaware of the "Pick-Tennessee-Products" logo designed to promote locally grown produce. While only 34.3 percent believed that the logo would actually help them as a producer, 63.2 percent felt that the logo would influence shoppers to buy local produce.

Twenty-four of the surveyed growers believed that a new or improved farmers' market in Chattanooga would increase their sales to urban customers.

Seventy-four percent of the producers had access to a privately owned packing facility should they choose to use one. Only one grower had ever sold produce through a marketing cooperative. Fewer than half of the growers were interested in forming a marketing cooperative with other producers.

While some of the producers who were interviewed appeared to be satisfied with their present marketing situation, others were interested in change. Producer response to several survey questions implies that there is potential within the study area for market improvements and innovations. Improvements in grading and standardization procedures could

increase the appeal of local produce to wholesale markets. The market power of local producers could be augmented if enough growers could be persuaded to join a cooperative. Overall market performance in the study area could be improved if local market facilities were upgraded.

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CHAPTER I

OBJECTIVES OF THE STUDY

Introduction

The fruit and vegetable industry of the United States is steadily expanding and continually changing in response to producer and consumer needs. Low prices and losses in farm income associated with traditional row crops and livestock operations have compelled some agricultural producers to consider practical alternatives. Specialty crops such as fruits and vegetables are frequently mentioned as suitable choices because, in many cases, expected returns per acre are considerably greater than those from traditional enterprises (Jermolowicz and Stafford, 1987). Per capita consumption of fresh produce has increased in recent years due to a growing concern over health issues, adding to the attractiveness of the produce industry (Creech, 1987). The Economic Research Service of the United States Department of Agriculture reported that the consumption of fresh fruit rose from 76.3 to 88.2 pounds per capita between 1970 and 1985. During the same time period, per capita consumption of fresh vegetables jumped from 66.3 to 81.4 pounds (Bunch, 1987).

The value of commercial fruit and vegetable production in the United States totaled 11,406.3 million dollars in 1985 (U.S.D.A., 1986). Oranges, apples, and grapes were the principal domestic fruits. Potatoes, tomatoes, and lettuce were the most significant to the U.S. vegetable industry in terms of value. Table 1-1 shows the value of production in 1985 for twenty fruits and vegetables in the United States.

Table 1-1. Value of U.S. production for twenty fruits and vegetables in 1985.

Fruits/ Vegetables	Value ($1000)	Percent of Total
Fruits:		
Oranges	1,549,177	25.9
Grapes	960,646	16.0
Apples	908,794	15.2
Strawberries	450,819	7.5
Peaches	308,532	5.2
Grapefruit	295,296	4.9
Pears	200,633	3.4
Lemons	175,054	2.9
Cherries	169,583	2.8
Avocados	164,416	2.7
Other fruits/berries	811,468	13.5
Total	5,994,418	100.0
Vegetables:		
Irish Potatoes	1,563,359	28.9
Tomatoes	1,195,554	22.1
Lettuce	674,704	12.5
Sweet Corn	368,069	6.8
Onions	347,247	6.4
Broccoli	239,345	4.4
Carrots	206,433	3.8
Celery	189,527	3.5
Cauliflower	169,133	3.1
Sweet Potatoes	142,936	2.6
Other vegetables	319,302	5.9
Total	5,411,896	100.0

Source: Agricultural Statistics, 1986

In 1985, U.S. crop farmers received 21 percent of their cash receipts from produce sales. During the same year, nearly 11 percent of all farm commodity and product receipts in the United States came from the produce industry (U.S.D.A., 1986).

Fruits and vegetables are harvested in all fifty states. A select few lead in production. Together, California and Florida account for 70 percent of U.S fruit production. Washington, Michigan, Oregon, New York, Massachusetts, Hawaii, and Arizona are also important suppliers to domestic production. California alone produces 47 percent of the vegetables sold commercially in the United States. Florida, Arizona, Texas, New York, Wisconsin, Oregon, Minnesota, and Washington are also significant to the U.S. vegetable industry (U.S.D.A., 1986).

A recent study showed that over 7,000 Tennessee farms were involved with the production of fruits and vegetables in 1982 (Brooker, 1985). Only 1,016 of these Tennessee farms selling vegetables, melons, fruits, or nuts sold over $10,000 worth of produce during 1982 (U.S. Bureau of the Census, 1984). Roughly 85 percent of all produce growers in Tennessee sell less than $10,000 worth of their commodity(s) each year. Cash receipts to farmers from produce sold in Tennessee in 1985 totaled 73.3 million dollars (Table 1-2). Up 35 percent from sales in 1983, the produce industry made a notable contribution to the farm income in Tennessee.

Other statistics show that Tennessee appears to be losing ground in the commercial produce industry. The acreage and value of production of the important produce commodities in Tennessee fell significantly between 1975 and 1985 (see p. 5). Tomatoes were a noteworthy exception. Acreage

Table 1-2. Cash receipts from marketing commercial produce in Tennessee, 1981-85[a].

Commodity	1981	1982	1983	1984	1985
Tomatoes (fresh)	$12,126	$12,428	$ 8,400	$19,320	$23,940
Snapbeans (processing)	5,717	3,645	1,784	2,313	2,284
Apples	1,188	691	1,144	1,427	994
Peaches	1,684	204	792	2,016	0
Irish Potatoes	2,372	1,896	1,284	2,200	2,200
Sweet Potatoes	2,251	1,007	1,151	1,003	958
Other Vegetables	33,992	36,358	38,894	47,994	42,949
Total	$59,330	$56,229	$53,449	$76,273	73,325

[a]All figures are in $1000
Source: Tennessee Agricultural Statistics, 1985-87

in Tennessee doubled for this commodity during this ten-year period. The total value of tomatoes produced in the state rose over 250 percent. In terms of both acreage and production, Tennessee growers gained two percent of the U.S. tomato market. Other southeastern states (Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, and South Carolina) have experienced similar downward trends in production (Table 1-3). In contrast, both California and Florida have steadily increased their market share.

Successful marketing of farm commodities and products is of paramount importance to a thriving farm enterprise (Thompson). Small farmers, i.e., Tennessee produce growers, face marketing problems which often surpass production difficulties in degree (Love). Dr. Harold G. Love, an extension professor in agricultural economics at the University

Table 1-3. Production of six major produce crops in the United States, Tennessee, Alabama, Arkansas, Georgia, Louisiana, North Carolina, South Carolina, Florida, and California, 1975 and 1985.

Commodity	Acreage (1000 ac) 1975	1985	Percentage Change in Acreage 1975 to 1985	Value of Production ($1000) 1975	1985	Percentage Change in Value of Production 1975 to 1985
Tomatoes						
US	124.9	124.6	- 0	390,154.0	631,187.6	+ 62
TN	2.1 (1.68)	4.5 (3.61)	+ 114	6,787.6 (1.74)	23,940.0 (3.79)	+ 253
AL	8.0 (6.40)	3.1 (2.42)	- 62	8,979.6 (2.30)	7,930.0 (1.26)	- 12
AR	3.2 (2.60)	1.7 (1.36)	- 47	11,577.5 (2.97)	7,990.0 (1.27)	- 31
GA	2.6 (2.08)	3.1 (2.48)	+ 19	5,817.5 (1.49)	5,049.9 (0.80)	- 13
LA	0.9 (0.68)	0.4 (0.32)	- 58	2,162.4 (0.55)	1,131.5 (0.18)	- 48
NC	1.9 (1.52)	1.8 (1.44)	- 5	4,218.0 (1.08)	3,996.0 (0.63)	- 5
SC	8.0 (6.40)	4.2 (3.37)	- 47	16,466.4 (4.22)	18,480.0 (2.93)	+ 12
CA	30.4 (24.34)	28.6 (22.96)	- 6	119,953.0 (30.74)	150,540.6 (23.86)	+ 25
FL	31.8 (25.46)	47.1 (37.81)	+ 48	156,540.6 (40.12)	409,770.0 (64.92)	+ 162
Snapbeans						
US	273.6	222.2	- 19	101,780.0	118,720.0	+ 16
TN	15.2 (5.55)	--- (---)	---	5,104.0 (5.01)	2,284.0 (1.92)	- 55
AR	4.0 (1.46)	3.3 (1.48)	- 17	1,483.2 (1.46)	1,251.0 (1.05)	- 61
Irish Potatoes						
US	1259.9	1358.0	- 8	1,442,741.0	1,563,359.0	+ 8
TN	5.0 (0.39)	1.1 (0.08)	- 78	3,187.5 (0.22)	2,850.0 (0.18)	- 10
AL	19.6 (1.55)	13.1 (1.00)	- 33	22,755.4 (1.60)	12,254.0 (0.78)	- 46
LA	2.6 (0.20)	0.6 (0.04)	- 77	819.0 (0.06)	588.0 (0.04)	- 28
NC	16.0 (1.27)	16.3 (1.20)	+ 2	16,128.0 (1.12)	12,268.7 (0.78)	- 24
CA	59.9 (4.75)	61.3 (4.51)	+ 2	126,459.5 (8.75)	186,454.9 (11.93)	+ 47
FL	27.5 (2.18)	35.1 (2.58)	+ 27	24,813.2 (1.72)	74,686.3 (4.78)	+ 200
Sweet Potatoes						
US	114.3	105.1	- 8	110,758.0	142,936.0	+ 29
TN	3.0 (2.63)	1.1 (1.05)	- 63	2,693.2 (2.43)	1,914.0 (1.34)	- 29
AL	5.8 (5.09)	6.4 (6.09)	+ 10	5,846.4 (5.28)	11,059.2 (7.74)	+ 89
GA	7.5 (6.58)	6.3 (6.00)	- 16	9,300.0 (8.40)	10,785.6 (7.55)	+ 16
LA	30.0 (26.32)	21.0 (20.00)	- 30	13,387.5 (12.09)	14,616.0 (10.23)	+ 9
MS	9.5 (8.33)	5.5 (5.24)	- 42	8,574.6 (7.74)	5,907.0 (4.13)	- 31

Table 1-3 continued.

Commodity	Production (million lbs.) 1975	Production (million lbs.) 1985	Percentage Change in Production 1975 to 1985	Value of Production ($1000) 1975	Value of Production ($1000) 1985	Percentage Change in Value of Production 1975 to 1985
Apples						
US	7530.0	7949.0	+ 5	460,894.0	908,794.0	+ 97
TN	10.0 (0.13)	8.5 (0.11)	- 15	1,060.0 (0.23)	1,105.0 (0.12)	+ 4
AR	21.1 (0.28)	16.0 (0.20)	- 24	1,670.0 (0.36)	1,856.0 (0.20)	+ 11
GA	--- (---)	20.0 (0.25)	---	--- (---)	2,240.0 (0.25)	---
NC	280.0 (3.72)	275.0 (3.46)	- 2	16,520.0 (3.58)	17,325.0 (1.91)	+ 5
SC	21.0 (2.79)	16.0 (0.20)	- 24	2,121.0 (0.46)	1,760.0 (0.19)	- 16
CA	460.0 (6.11)	620.0 (7.80)	+ 35	26,680.0 (5.79)	58,280.0 (6.41)	+ 118
Peaches						
US	2835.6	2148.3	- 24	274,958.0	308,532.0	+ 12
TN	8.7 (0.31)	--- (---)	---	1,170.0 (0.42)	--- (---)	---
AL	7.0 (0.25)	1.5 (0.07)	- 78	1,589.0 (0.58)	4,575.0 (1.48)	- 71
AR	35.0 (1.23)	5.0 (0.23)	- 85	4,795.0 (1.74)	860.0 (0.28)	- 82
GA	95.0 (3.35)	90.0 (4.19)	- 5	22,610.0 (8.22)	22,140.0 (7.18)	- 2
LA	3.0 (0.11)	6.5 (0.30)	+ 116	615.0 (0.22)	2,145.0 (0.69)	+ 248
NC	30.0 (1.06)	2.0 (0.09)	- 93	5,250.0 (1.91)	500.0 (0.16)	- 90
SC	210.0 (7.40)	230.0 (10.71)	+ 9	34,020.0 (12.37)	46,460.0 (15.06)	+ 36
CA	1829.0 (64.50)	1471.0 (68.47)	- 19	134,841.0 (49.04)	163,754.0 (53.07)	+ 21

Source of figures for commodity acreage and value of production: Agricultural Statistics, 1986
Note: Figures inside parentheses are percentages of United States totals for the acreage and value of production of each commodity.

of Kentucky, found that the following marketing problems are associated with small produce farmers.

1. Disparities in quality, grades, and other standards. Uniformity is necessary for efficient marketing.

2. Small growers deal in small volumes of the commodity to be sold, lending to added market inefficiencies.

3. Large scale buyers have access to market information which is unavailable to small farmers. To make sound decisions, all market participants need proper information.

4. Difficulties in coordinating the production of many small units with market needs of comparatively few large buyers, causing market inefficiencies.

5. Those market participants who deal in small volumes are confronted with increasing costs of assembly and transportation.

6. In many cases small growers face limited access to markets.

7. Unstable prices are often a serious problem for farmers. Large growers can sometimes contract their production to establish prices on produce. Small growers, however, may not have this option.

8. Small farmers sell smaller lots of produce and have fewer marketing alternatives than larger producers. Therefore, they have less market power than their competitors.

9. Small growers tend not to join marketing cooperatives. Cooperatives are an investment in a system to market commodities and a viable means of gaining market power (Love).

These problems stem from characteristics inherent in the produce marketing system. This system has become highly complex. It involves an increasing number of steps between the sale of a primary product by the farmer and the final purchase by the consumer. Many small farmers are faced with a few large buyers and a concentrated market system (Thompson).

According to James B. Bell, an extension specialist in marketing at Virginia Polytechnic Institute, there are six characteristics that large

produce buyers (buyers for chain stores, voluntary chain stores, or large wholesalers) look for in a potential supply source (Bell).

1. "A large volume from one source," eliminating many small purchases.

2. "A dependable supply, available over a long period of time." This keeps the cost of locating new sources at a minimum.

3. "Consistent quality and as high a quality as can be purchased at the market price."

4. The availability of a wide assortment of wholesale and consumer packages. This will enable the buyer to meet a diverse retail demand.

5. "A full line of produce," again, to minimize the number of sources used.

6. A reputable source to assure top quality produce (Bell, p. 104).

Wholesalers and retail chains in the food industry continue to grow in size and power, preferring to obtain their produce from as few sellers as possible (Brooker, Epperson, Law, and Bateman,1983). As a result, gaining access to these commercial marketing channels is made difficult for low volume growers.

Despite these problems, the commercial produce industry in Tennessee appears to have a bright future. Dr. Robert P. Jenkins, a professor with the Department of Agricultural Economics and Resource Development at the University of Tennessee in Knoxville, states several reasons for such an optimistic outlook.

1. "Closeness to consumers." Approximately 2/3 of all U.S. consumers live within one shipping day of Tennessee.

2. An abundant water supply, when compared to other primary production regions.

3. Produce varieties that are well adapted to the area.

4. The increased support of fruit and vegetable production by government and farm groups.

5. Improved marketing facilities and development of marketing expertise for in state and national sales (Jenkins, p. 3).

A vast potential exists for the fruit and vegetable industry in the Tennessee Valley region if markets can be developed for production (Williams). An emphasis is being placed on increasing the market share for a wide variety of Tennessee produce (Tennessee Crop Reporting Board, 1987).

Marketing is a key component in building a successful produce enterprise (Goodwin, 1987). It also represents a serious challenge to growers who are faced with thin or seasonal markets for their crops. The seasonal and perishable nature of fresh produce adds to the risk already associated with an uncertain market. Facilitation of the marketing process requires knowledge of background details. These details include grower population, types and amounts of production, methods of risk management, grading and standardization procedures, and market outlets employed.

Objectives

The broad intent of this study was to examine the market structure of the commercial fruit and vegetable industry in a selected study area of Tennessee. Emphasis was placed on the supply-side of the market. Basic information regarding current production and marketing channels is needed by producers and other industry participants in order to make

better use of existing resources and to provide a basis for beneficial change. Specific objectives are:

1. To identify the population of commercial fruit and vegetable growers in the study area.
2. To ascertain the diversity and extent of production.
3. To analyze producer behavior regarding utilization of standardization and grading, market outlets and information, and risk management.
4. To analyze the performance of existing packing facilities and market outlets.

Procedure

An eight-county region in East Tennessee was chosen as the area for this study. The counties of Bledsoe, Coffee, Franklin, Grundy, Marion, Sequatchie, Van Buren, and Warren were included in the study area. The location of the study area is shown on a map of Tennessee in Appendix A. This specific region was chosen for several reasons: 1) Growers in this region had previously expressed an interest in expanding their fruit and vegetable production. 2) The area was close to the University of Tennessee at Knoxville - this would help to keep survey costs at a minimum. 3) The extension agents in these counties were interested in this study. 4) Results of the study in this region should be fairly typical of other areas in Tennessee.

Each county extension leader in the study area was asked to provide a list of the commercial fruit and vegetable producers in his/her county. Together, these lists provided a population of 339 growers. Each grower

on the list was assigned a corresponding number. A random sample was drawn (using a random number table) from this population for the purpose of conducting a grower survey. Initial consultation with one county extension leader revealed that a number of home gardeners had been inadvertently included in the list of commercial growers. To exclude individuals growing for personal use and to obtain a truer population (and therefore more accurate results), each extension leader was asked to revise his/her list. The revised population consisted of 173 producers. A random sample was again drawn for survey purposes. This sample included fifty growers to be surveyed. This sample size was selected for two primary reasons. Statistical estimations and tests of hypotheses are only valid within the framework of the Central Limit Theorem (Mason). This theorem states that, "If the sample size n is sufficiently large, the sampling distribution of the mean will be approximately normal." Arbitrarily, most researchers consider a sample size of 30 or more to be "sufficiently large." Because the growers were to be personally interviewed, travel time and costs were also taken into consideration when choosing the sample size.

The diversity and extent of production was ascertained through questions concerning types of crops grown, acreage, and average marketable yields. Several questions were designed to support analysis of producer behavior. To determine the utilization of standardization and grading, each grower was asked to describe his/her methods of preparing produce for marketing. Data on the use of market outlets and market information were gained by asking questions about: (a) types and locations of market outlets, (b) reactions to prices offered by buyers, and (c) methods used

to obtain market information. The ways management responded to factors such as risk and uncertainty were detected through questions referring to enterprise diversification, spreading of sales, and contract production.

Two types of questions investigated the performance of existing packing facilities and market outlets. Growers were questioned about the availability of existing markets and packinghouses. Grower opinions regarding these facilities and possible future changes were also requested.

Description of the Study Area

The area chosen for this Tennessee study encompasses the counties of Bledsoe, Sequatchie, Marion, Franklin, Grundy, Coffee, Warren, and Van Buren. Topographically, it includes portions of the Cumberland Plateau, the Cumberland Escarpment, Walden Ridge, the Sequatchie Valley, the Eastern Highland Rim, and the Central Basin. Physiographic features range from rolling hills in the Sequatchie Valley to deep gorges and escarpments where the valley rises to meet the Cumberland Plateau and Walden Ridge. The Cumberland Plateau, Walden Ridge, the Highland Rim, and Central Basin are each largely diversified with low rolling hills, upland flats, and valleys. Elevation ranges from less than 800 feet above sea level at the Caney Fork River in Warren County to 2,390 feet on Walden Ridge in Sequatchie County.

The soils of this region are extremely divergent. They range from high to low in productivity and from easy to hard in workability. Most of the soils are well-drained. At least 50 percent of the area is suitable for cultivation.

The climate in the study region is temperate and humid. Summers are hot; winters mild with a few extremely cold periods.

In this eight-county area of Tennessee, there are 4,885 farms. Fruits and vegetables are produced commercially on 164 of these farms. In 1978, 2,938 acres were devoted to the commercial produce industry in this region. The total market value of fruits and vegetables sold during the same year was $1,766,000, representing 1.7 percent of the 1978 total market value for all agricultural products in the study area.

CHAPTER II

REVIEW OF RELATED LITERATURE

Economic studies pertaining to the United States commercial fruit and vegetable industry encompass a broad range of topics. Topics examined during the past decade include descriptions of existing marketing systems and marketing alternatives available to the small produce farmer. Researchers identified the benefits, problems, and potentials of these marketing channels.

Marketing research in the Southern United States has covered market access problems and related difficulties, evaluations of existing produce markets, and the characteristics of small commercial farmers. Studies specific to Tennessee include descriptions and assessments of the produce market in Tennessee and its structure.

Marketing Systems and Alternatives

Produce is sold and channeled through a diverse system of market outlets. Classification of these market outlets is to a degree imprecise. A 1982 study, co-sponsored by the TVA and the Southern Regional Fruit and Vegetable Market Research Committee, divides the fresh produce marketing system into two principle outlets. Direct market outlets and wholesale market outlets are the main alternatives available to the commercial producer (Vitelli, et al.). Most current research has been concentrated on the nontraditional direct marketing outlets.

Direct Markets

Direct markets exist where produce is sold directly from the farmer to the consumer. They are sometimes thought of as a means of by-passing the traditional marketing system (Thompson). Growers receive higher prices, and consumers receive higher quality produce by using direct marketing channels (German and Deckers). Despite these advantages, the percentage of fresh produce marketed directly is relatively small (Hinson).

Direct marketing may be subdivided into three main types of outlets. These three types are roadside stands, pick-your-own (PYO) operations, and farmers' markets. Roadside stands vary in physical facilities, seasonality, and produce sources (Vitelli, et al.). Physical facilities range from makeshift tables to permanent buildings. Produce may be sold seasonally by the producer/operator. The operator may also purchase fresh produce from other sources to enable year-round sales (Vitelli, et al).

PYO operations are increasing in popularity (Fabian). They are a viable means of harvesting crops whose maturity stage is easily identified (Free and Adrian). Fabian found that small fruits (such as blueberries and strawberries) and tree fruits (such as apples and peaches) can be successfully used in PYO operations (Fabian). Tomatoes, peas, snapbeans, and sweetcorn are vegetables that are commonly harvested in PYO settings (Fabian).

Farmers' markets are also an extremely diverse marketing channel. Facilities vary according to available financing and to accommodate the expected volume of produce (Kenyon, Grantham, and Edgar). Large regional

markets (such as those in Atlanta, Knoxville, and Memphis) attract produce year-round from long distance sources (Free and Adrian). Many of these large farmers' markets act as wholesale markets and disassembly points for produce (Vitelli, et al). Small seasonal local markets serve growers in nearby communities.

Thompson divides direct marketing into two categories. These categories distinguish between direct marketing to consumers and direct marketing to retail stores, restaurants, and institutions. Thompson places roadside stands, PYO operations, and farmers' markets under the category of direct marketing to consumers. He also includes marketing to consumer cooperatives and to institutions in this category. Consumer cooperatives are comprised of buyers whose very goal is to by-pass the traditional marketing system. These buyers wish to obtain higher quality produce at lower prices. Direct marketing to local retail stores and restaurants offers the small produce farmer an alternative to traditional marketing channels. Government institutions (such as schools, military bases, and prisons) can also be utilized by local produce growers (Thompson).

Brooker categorizes direct marketing outlets under the heading of noncommercial markets. Direct marketing outlets are subdivided into off-farm outlets and on-farm outlets. Off-farm outlets include farmers' markets and peddling, while on-farm markets consist of roadside markets, PYO operations, and farm-house sales.

Direct Marketing of Tennessee Produce

In 1979, 12 percent of the produce grown in Tennessee was sold through direct marketing channels (Brooker). A 1981 survey of Tennessee County Extension Leaders located 200 PYO outlets, 64 roadside markets, and

23 farmers' markets in Tennessee. Sales of Tennessee vegetables marketed through roadside stands comprised 63 percent of all Tennessee vegetables marketed directly in 1979. Sixteen percent were sold through farmers' markets. PYO outlets represented 48 percent of direct market sales of Tennessee fruit during the same year. Seventeen percent of fruit marketed directly was sold through roadside stands and one percent at farmers' markets (Brooker). Brooker states that direct produce sales accounted for one-fourth of one percent of agricultural sales in Tennessee in 1979.

The 1982 study by Vitelli, et al. presented a subjective evaluation of potential for PYO outlets and farmers' markets in Tennessee. PYO outlets for fresh snapbeans, okra, apples, peaches, and strawberries were characterized as good established markets for some Tennessee production regions. PYO outlets for fresh spinach greens, Southern peas, and summer squash were depicted as "fair" or "infant" industries. Markets for the following PYO fruits and vegetables were described as "weak" -- cucumbers, eggplant, bell peppers, Irish potatoes, sweet potatoes, turnips, pears, table grapes, blueberries, blackberries, and raspberries. Sales expansion through Tennessee PYO outlets appears to be optimistic for lima beans, broccoli, tomatoes, peaches, table grapes, blueberries, strawberries, blackberries, and raspberries (Vitelli, et al.). Results of this study indicated good, established markets for fresh Tennessee lima beans, snapbeans, cabbage, sweetcorn, okra, Southern peas, sweet potatoes, tomatoes, cantaloupes, watermelons, peaches, and strawberries sold through farmers' markets. "Fair" or "infant" industries exist for fresh broccoli, cucumbers, spinach greens, bell peppers, Irish potatoes, summer squash, and apples sold at farmers' markets. Fresh market sales of eggplant,

turnips, pears, table grapes, blueberries, blackberries, and raspberries at farmers' markets were rated as "weak." Expansion appears optimistic for sales of the following through Tennessee farmers' markets: snapbeans, broccoli, winter squash, cantaloupes, peaches, table grapes, blueberries, strawberries, blackberries, and raspberries (Vitelli, et al.).

Benefits of Direct Marketing

Direct marketing provides various benefits to producers. It gives small farmers a greater opportunity to market their products (Free and Adrian). In some cases, direct marketing may be the only alternative for the small producer. Direct marketing eliminates the middleman, lowers costs and increases returns to the producer.

Roadside marketing, PYO operations, and farmers' markets each have unique advantages. Roadside marketing gives the grower/seller easy access to the crop supply, to storage, and to family labor (German and Deckers). Free and Adrian list five advantages to the producer with a PYO operation. They are: 1) a reduction in labor costs and other costs related to harvesting, 2) elimination of storage, grading, and packing costs, 3) no middleman, 4) crops usually have higher yields, and 5) a reduction in price variability and therefore a reduction in risk. Farmers markets' provide another set of advantages to the producer. They are: 1) limited liability for customers who are not on the property of the grower, 2) public facilities (such as restrooms and parking space) and advertising are the responsibility of the market, not the individual producer, and 3) unlike other forms of direct marketing, a continuous supply of produce by an individual grower is not as essential (Free and Adrian).

Consumers also benefit from direct marketing. They receive a higher quality of produce. Consumers believe that directly marketed produce has a better taste and appearance than produce from other sources (Free and Adrian). Locally grown produce also has a higher nutritional value (Vitelli, et al).

Problems With Direct Marketing

Direct marketing also has disadvantages. Roadside market producers have many added management responsibilities (German and Deckers). These concerns include proper location, adequate parking, market layout, proper equipment, produce displays, packaging, pricing, advertising, and salesmanship. In addition, roadside sales may be limited if the market is too isolated (Thompson).

Free and Adrian name several disadvantages to PYO operations: 1) PYO operations demand a higher quality of management than do other marketing options, 2) the PYO producer must also act as a retailer, 3) lack of customers or bad weather can lower returns to the grower, 4) long hours are required of the management, and 5) the producer is liable for the safety of the customer. Jenkins gives two more problems with PYO operations. Produce sold by volume is often damaged by customers who attempt to pack it down. Customers also usually neglect to mark where they have finished picking (Jenkins).

Free and Adrian found that farmers' markets present growers with a unique set of problems: 1) management and/or labor is displaced from the farm operation to transport and sell produce, 2) the grower must often rent a stall for a year when he/she only needs it for a brief time period, 3) market hours and advertising are controlled by the market and may not

be in the best interests of the grower, and 4) badly located markets (usually older and larger city markets) may not attract customers. Jenkins adds that most small farmers' markets have an insufficient supplies of produce.

Case Studies

In 1977 and 1978, Solverson and Ellerman studied barriers to direct marketing of fruits and vegetables in two Illinois counties. Their objective was to identify existing and potential barriers to roadside stands, PYO operations, farmers' markets, and direct sales to retail grocery stores. Farmers in these two counties developed direct marketing channels as a response to low returns received by produce sales through traditional outlets.

Solverson and Ellerman collected information on roadside markets and PYO operations through observation and by speaking with the extension agents in each county. Information on farmers' markets was obtained by using questionnaires. All of the producers for the Carbondale Farmers' Market and a sample of the consumers at the same market were surveyed. All retail grocers in the two-county area were surveyed.

Solverson and Ellerman found several barriers to roadside stands. These barriers were location, limited demand, access and parking problems, and a lack of quality management and marketing skills. Barriers to PYO operations included a limited demand, a limited number of crop alternatives, short picking seasons, limited consumer access, and poor field management. Barriers to marketing through farmers' markets were, again, a lack of good marketing skills (mostly in the area of pricing) and an insufficient supply of produce. Producers who used Carbondale Farmers'

Market were generally young, well educated part-time farmers with low amounts of farm income and relatively high off-farm incomes.

Actual and potential barriers to sales to retail grocery stores were -- billing and credit policies, packaging, delivery scheduling, and a continuous supplies of produce (Solverson and Ellerman). Retailers felt that quality, price and availability were the three most important factors in purchasing produce from growers. They concluded that the greatest potential for direct marketing in the study area exists for direct sales to retailers (Solverson and Ellerman).

Overall, Solverson and Ellerman found that different barriers hindered each direct marketing method. A lack of demand required producers using roadside markets, PYO operations, or farmers markets to find secondary markets. These producers also lacked proper management skills and had problems with grading, packaging, and market access. Growers using farmers' markets had particular problems with erratic pricing and failure to produce for market demand. Market bylaws also acted as barriers to producers who used farmers' markets (Solverson and Ellerman).

Wall and Colette estimated the direct marketing potential for fresh vegetables in a five county area of northern Florida. Potential market volume, relative market shares for each vegetable sold (by outlet), and the number of acres needed to support local consumption were identified. These three variables determined the existing direct marketing potential for each outlet.

Wall and Colette found that nearly one-fourth of total fresh vegetable sales in the study area were represented by sales to local

markets. Three vegetables accounted for almost 75 percent of the sales volume. Potential of local fresh vegetable sales could be best increased by selling to independent retail grocers. Wall and Colette stated that the results of their study may be applied to rural areas throughout the South.

In a 1977 bulletin, Brown analyzed and described roadside markets in Georgia. This study provided present and prospective owner/operators of roadside markets with useful economic information. It also determined the role of these markets in increasing farm income. Brown interviewed 53 roadside market operators who specialized in either apple or peach production.

Brown noted several interesting observations. Advertising was used by most operators, usually in the form of roadside signs. The number of roadside signs used and the volume of weekly sales were positively correlated. The most significant variable to gross sales was the number of customers. Owners were the primary source of labor and two-thirds of those markets surveyed used only family labor. On the average, two-thirds of total production was marketed at roadside stands. Eighty-three percent of the operators reported that their prices were lower than those in retail stores. In terms of potential, Brown stated that growing a "proper mix" of produce would enable year-round sales. Thus, returns would be increased substantially, over and above costs.

Ramsey and Love analyzed roadside market management in Kentucky. Roadside market practices were identified and studied. Those associated with profitable operations were noted. Another goal was to give owner/operators of roadside markets useful information for self-evaluation

and improvement. To obtain the information they needed, Ramsey and Love surveyed 30 of the 200 roadside market operators in Kentucky.

Variables found to be associated with profitable roadside operations were time, market mix, advertising, pricing, and packaging (Ramsey and Love). Time-wise, long hours of operation characterized successful markets. Ramsey and Love noted a positive correlation between years in business and sales and profits. In terms of market mix, over one half of the markets surveyed specialized in one product. Exposure to multiple and complementary products encouraged customers to increase the size of their purchases. Advertising methods varied greatly. Some markets used no advertisements at all. Ramsey and Love suggest that this lack of advertising has left some parts of a potential market untapped. Prices at roadside markets were generally lower than those in local retail stores. However, pricing was not based on market supply and demand, cost and profit targets, or competition. Operators could improve their pricing strategy if more price information was available to them. Packaging varied with operator views of market needs and consumer preferences. For 28 of 30 operators, lack of labor was a major constraint to production and sales. Seventy-five percent of the roadside markets used only family labor. Those who hired off-farm labor had a high turnover rate. Ramsey and Love concluded that both the number and size of successful roadside markets can be expanded through careful planning and skillful management (Ramsey and Love).

Sabota and Courter analyzed the potential for PYO marketing in a rural area of Illinois. They reported crop preferences, attitudes, and buying habits of consumers in the study area. Consumers who participated

in PYO harvesting on experimental plots owned by the University of Illinois were surveyed. Sabota and Courter also used information from an earlier PYO strawberry survey in reporting their results on consumer driving distances, purchasing habits, and consumption.

Consumers participating in PYO operations felt that they were receiving a high quality product at a fair price (Sabota and Courter). Local availability was also an important concern. The appeal of PYO to consumers was diminished as driving distances to the farm became too great. Types of produce most often wanted by PYO customers were berries, sweetcorn, tree fruits, beans, tomatoes, melons, cucumbers, and peppers. Consumer crop preferences varied by location and, as with roadside marketing, offering a variety of produce increased consumer purchases. Sabota and Courter concluded that PYO may not be suitable for all growers or farms.

Kenyon, Grantham, and Edgar conducted surveys of eight selected farmers' markets. Located in four different states (North Carolina, Virginia, West Virginia, and Tennessee), these markets varied in size, ownership, and physical facilities. Markets were located in cities whose populations ranged from 7,000 to 179,000 people. Three separate types of surveys were taken at each market. Researchers interviewed consumers, producer/vendors, and the market management at each location. Price comparisons between each farmers' market and the closest supermarket were made.

Nearly half of the consumers surveyed bought produce at a farmers' market because it was judged to fresher and of better quality than produce found at other market outlets (Kenyon, Grantham, and Edgar). Another

important consideration was price. Consumers found prices at farmers' markets to be lower when compared with nearby grocery stores.

Farmers selling at the eight markets surveyed were full-time farmers with small vegetable acreages. They used a farmers' market as their primary market outlet for produce (Kenyon, Grantham, and Edgar). Daily sales averaged (midpoint) at $100. Farmers traveled an average distance of 20 miles (one way) to the market. The average distance traveled by farmers was longer to larger and more well established farmers' markets (Kenyon, Grantham, and Edgar).

Kenyon, Grantham, and Edgar state that farmers' markets must be of a certain size in order to be "viable" markets. There must be enough farmers to "ensure a constant supply with a good variety of offerings." When the number of farmers at a given market falls, the supply and variety of produce decreases. Customers will then quit coming to that market. As a result, the number of farmers will fall even further, usually ending the season.

Methods of financing farmers' markets vary greatly according to market size and function (Kenyon, Grantham, and Edgar). Some farmers' markets received a daily commission which was based on gross sales. Advance fees or daily fees were also a means of market income. Based on their study, if farmers' markets are financed solely by traditional market fees, then building new market facilities is infeasible. Some type of subsidization (private, state, or federal) is needed to build new farmers' markets or to improve existing facilities.

Potential For Direct Marketing

Consumers are creating growing opportunities for direct marketing as they realize the importance of fresh produce in their diets (Free and Adrian). Studies by Solverson and Ellerman, Wall and Colette, Ramsey and Love, Ames, Marion, and Christensen, Archer, and Vitelli, et al. have concluded that there is an existing potential for the expansion of direct marketing. Free and Adrian found that most researchers agree that direct marketing will represent a larger share of the produce market in future years (Free and Adrian).

Wholesale Markets

Direct market outlets become saturated as the production of a specific produce crop becomes geographically concentrated. Conventional marketing channels must then be found (Bell). In a geographic region, the percentage of a specific crop sold through conventional marketing channels varies directly with the amount of acreage devoted to that crop (Bell). Traditionally, fresh produce has been sold through wholesale markets. Kohls and Uhl separate wholesale marketing channels into three primary markets. These three primary markets are shipping point markets, wholesale markets, and retail markets.

Shipping point firms consist of cooperatives, grower-packers, assemblers, agents and brokers, and buying offices (Kohls and Uhl). These firms represent a varied mixture of production and marketing functions. Located in areas of production, shipping point firms assemble large volumes of produce from many different growers. Next, the produce is prepared for market by cleaning, sorting, grading, packing, and storing.

Shipping point firms then disperse fresh produce to wholesale terminal markets, integrated wholesale-retail markets, and export markets.

Wholesale terminal markets include merchant wholesalers, commission merchants, agents, jobbers, and brokers (Kohls and Uhl). Located in population centers, wholesale terminal markets receive produce from shipping point markets and break it down into smaller lots. Wholesalers then sell to retail food stores (such as supermarkets or fruit and vegetable markets) and food service firms (such as restaurants and institutions). Retailers then make the ultimate sale of fresh produce to the final consumer.

Wholesale markets are diverse and involve various types of middlemen. Large volumes of produce are indirectly channeled from the producer to the consumer via the middleman. Middlemen may be divided into two main categories -- functional wholesalers and merchant wholesalers .

The 1982 study by Vitelli, et al. provides a further breakdown and description of wholesalers. Functional wholesalers negotiate trades between growers and retailers, merchant wholesalers, or processors. They do not take title to the produce being marketed. Negotiations take place through selling agents, brokers, commission merchants, auctions. Merchant wholesalers buy produce with the intention of reselling it. They take title to the produce and may then re-grade, re-sort, and re-package it as they deem necessary. Merchant wholesalers include merchant shippers, terminal market firms, independent wholesale buyers, jobbers, corporate chainstore wholesale warehouses, and voluntary chain store warehouses (Vitelli, et al.).

Wholesale Marketing of Tennessee Produce

In 1981, 133 wholesalers handled produce in Tennessee (Brooker). A study involving these wholesalers revealed a reluctance to try new suppliers. It also showed that the wholesalers' stringent requirements for consistency in quality creates a significant access barrier for Tennessee producers (Brooker).

The 1982 study by Vitelli, et al. presented a subjective evaluation of potential commercial sales in Tennessee for 28 fresh fruits and vegetables. Tennessee wholesale markets for fresh tomatoes and apples and for processed lima beans, cabbage, spinach greens, Southern peas, pimento peppers, and summer squash were characterized as good, established markets for some Tennessee production regions. Wholesale markets for fresh cabbage, eggplant, sweet potatoes, and cantaloupes and for processed bell peppers and turnips were described as "fair" or "infant" industries. Those wholesale outlets for fresh snapbeans, peaches, pears, blueberries, and raspberries received a "weak" rating. Market expansion for fresh cabbage, bell peppers, Irish potatoes, sweet potatoes, summer squash, and tomatoes appeared optimistic. (Vitelli, et al.).

Problems With Wholesale Marketing

Despite the diversity of wholesale market outlets in the produce industry, many small growers are still faced with a few large buyers and a concentrated market system (Thompson). Large produce buyers require the following of their sources -- consistency, uniformity, proper grading and sizing, lots of large volume, proper containers, dependability, and a willingness to maintain good communication (Mizelle). Small producers

often fall short of these requirements, causing serious problems in the marketplace.

Small producers tend to be seasonal with their supply and do not have well-established reputations, making them undependable supply sources (Bell). These growers offer produce buyers small lots of variable quality, resulting in marketing inefficiencies. Small lots or lots of variable quality are frequently discounted by wholesalers due to increased handling costs (Love). Small growers are often unaware of the container requirements of buyers. Lack of communication leads to the production of unwanted varieties/types of produce (Mizelle).

Thompson presents several problems with wholesale markets from the perspective of the farmer. These small growers, pricetakers in the marketplace, complain of inadequate or unfair prices. They object to "wrongful" treatment in the market, such as excessive handling charges and unfair grading methods (Thompson). Thompson states that these problems are related to characteristics specific to small farmers. Some of these attributes are lack of bargaining strength, absence of economies of size in handling, and an unfamiliarity with grading standards and market regulations (Thompson).

Small producers possess low bargaining strength because they are price-takers facing a limited number of marketing alternatives. They usually cannot wait for higher prices. The large produce buyer has many options while the small grower has few (Thompson). In a market system ideal for accommodating volume, small growers do not reach economies of scale in handling. As discussed previously, small lots are discounted by buyers due to additional handling charges that are incurred (Love).

Unfamiliarity with grading standards and market regulations stems from a general lack of market knowledge and information. Small producers often lack proper training, expertise, and knowledge in the area of marketing (Love). They have problems obtaining relevant market information (Thompson). Love relates this to "peer group similarity," stating that small farmers usually do not socialize with large commercial farmers. They are, therefore, less apt to obtain useful marketing knowledge and information through social interaction (Love). Market information on prices, grades and standards, and available market alternatives is necessary for proper managerial decision-making (Thompson).

Small producers have a lower risk preference than do larger commercial growers (Love). There are substantial risks associated with the fresh produce industry. Weather (ie., losses due to drought, frost, or hail) and rapid price fluctuations represent costly unknowns to the producer of fresh fruits or vegetables (Paul). The uncertainty of the fresh produce market is extremely hard on small producers who are limited in capital (Thompson). Although risk may be combated to some extent by diversification, Vail found that small farmers can over-diversify. Consequently, this leaves them too small in each enterprise to gain economical access to commercial markets (Thompson).

Characteristics of Small Farmers

Love states that agricultural marketing systems are influenced markedly by the sociological characteristics of small farmers. This was substantiated in the previous discussion on wholesale marketing problems. The Food and Agricultural Act of 1977 defines a small farmer as "any

person who depends on farming as his primary source of income, whose grossannual sales from farming are less than $20,000, and whose income from non-farm sources is less than $5000." A study of the 1974 U.S. Census in 1978 showed that 81 percent of farms in the South have annual gross sales of under $20,000 (Paul, Bohall, and Plato). W. Joe Free, an agricultural economist with the Tennessee Valley Authority, adds that small produce farms are those with limited access to wholesale markets. This limitation arises because of size or isolationism (Free).

Love states several important characteristics displayed by small farmers.

1. "Fewer full-time workers" are available to small growers.
2. "Lack of expertise, training, and knowledge of marketing."
3. "Nonuse of [market] information."
4. "Lower risk preference."
5. "Peer group similarity." Small farmers usually do not socialize with commercial farmers. Therefore they are less apt to obtain useful marketing knowledge and information through social interaction.
6. "Concentration of low-income people." Small farm operations are usually concentrated in areas of relatively low quality land resources (Love, p. 86).

In 1983, Hinson conducted a producer survey to discover the characteristics of small commercial farms in Louisiana. He characterized each farm by the type of farming area and by attributes of farms found within each specific area. Hinson looked at gross farm sales, operator and spouse nonfarm income, whether the farm operator held a full-time nonfarm job, and the degree of participation in Extension activities on the part of the farmer (Hinson).

As a result of this 1983 study, Hinson suggested four criteria for small commercial farms in Louisiana (Hinson, pg.3).

1. Gross sales are between $5,000 and $40,000 annually.
2. The primary enterprise is something other than beef cattle.
3. The farm operator and family provide management and most of the labor for the farm enterprise.
4. Farm income is a substantial portion of family income.

Hinson evaluated the influence of specific characteristics on gross farm sales in each farming area. He determined linear regression coefficients and correlation coefficients for each relevant variable. The following variables influenced gross farm sales significantly -- number of crop acres, spouse nonfarm income, spouse education, operator nonfarm income, and hours of operator labor available for farm work. Operator age and operator education had no significant impact on gross farm sales (Hinson).

Potential For Wholesale Marketing of Produce

Market access. Paul states that the access problem is how does the small producer compete in the present wholesale marketing system? Small farmers are a part of this system and must relate to it (Thompson). Producers must initiate improvements in order to become a recognized force in the wholesale produce industry (Zwingli, et al.). A 1987 Alabama study concluded that producers must:

1. Recognize the importance of marketing activities associated with fresh vegetable production.
2. Produce and ship a high quality product properly packaged and handled.
3. Produce in sufficient quantity to attract wholesale attention.
4. Provide markets with a given crop for as long as possible.
5. Provide markets with a given crop from year-to-year to establish a reputation as a consistent (volume and quality) producer.

6. Recognize the importance of maintaining a reputation as a viable member of the industry.
7. Maintain the highest yield levels of the highest quality possible.
8. Follow production and variety recommendations.
9. Explore market opportunities prior to the production of a given crop.
10. Expect and be willing and able to assume the risk of negative net returns during some years and harvest periods (Zwingli, et al., p. 48).

Increasing the potential for access to wholesale produce markets appears to lie in the hands of the producer (Brooker, et al.).

Cooperatives. Cooperatives can successfully assist growers with the marketing of fresh produce. They are owned, controlled by, and meant to benefit the members, not outside investors (Sexton). The ultimate goal of a cooperative is to enhance the financial status of the producer (Jermolowicz and Stafford). Forward integration by producers through cooperatives into the wholesale market system would help to lessen disparities in market power between small growers and large buyers (Sexton).

Cooperatives can help small farmers improve the prices they receive for their produce, effectively handle unfair marketing practices, and improve the quality of the produce they sell (Nielson). Marketing cooperatives can consolidate member products and provide volume shipments, thus more easily attracting and retaining large commercial buyers (Jermolowicz and Stafford). Packing and marketing cooperatives that are cooperatively owned can improve the competitive status of their members. They do so by proper maintenance of those quality, packing and shipping standards that are required by commercial buyers and by coordination of product deliveries to these buyers (Jermolowicz and Stafford).

CHAPTER III

RESULTS OF THE STUDY

Description of Producer Population

An integral part of market structure is the producer. The first objective of this study was to identify and describe the population of commercial fruit and vegetable growers in the study area. The section Procedure, in Chapter 1, describes the means by which a random sample of 38 growers was chosen to be interviewed. A copy of the survey instrument used to conduct this interview and obtain data for this analysis can be found in Appendix B.

Form of Business

Over 68 percent of the growers surveyed named their type of business as an individual proprietorship (Table 3-1). The remaining 32 percent characterized their businesses as family partnerships.

Table 3-1. Form of business organization as reported by 38 commercial fruit and vegetable growers in Tennessee, 1987.

Type of Business	Growers n[a]	Growers %
Individual proprietorship	26	68.4
Family partnership	12	31.6
Total	38	100.0

[a]n refers to the number of growers

Sources of Household Income

Slightly more than one-fourth of the 38 growers surveyed received 100 percent of their income from farming in 1986 (Table 3-2). Nearly half, 47.4 percent, of these growers received less than 25 percent of their household income from farming. Of notable interest is that the surveyed growers either received most of their household income or little of their household income from farming. Few growers were in the middle area between these two catagories.

Table 3-2. Sources of household income for 38 commercial fruit and vegetable producers in lower East Tennessee and the share of household income received from each source, as reported in 1987.

Share of Household Income Received	Source					
	Farming		Off-Farm Employment		Other[a]	
	n[b]	%	n	%	n	%
0	-	-	20	52.6	28	73.7
1-24	18	47.4	4	10.5	-	-
25-49	3	7.9	2	5.3	-	-
50-74	3	7.9	-	-	1	2.6
75-99	4	10.5	12	31.6	9	23.7
100	10	26.3	-	-	-	-
Total	38	100.0	38	100.0	38	100.0

[a]Other sources of household income primarily include Social Security and other retirement benefits/payments.

[b]n refers to the number of growers

Off-Farm Employment

Almost half of the 38 growers surveyed received a portion of their 1986 household income from some type of off-farm employment (Table 3-2). A little over 30 percent of the growers interviewed received at least three-fourths of their household income from off-farm employment in 1986.

Nearly 30 percent of the primary operators surveyed spend at least 40 hours a week working at jobs off the farm (Figure 3-1). One-fourth of the growers who were married (89.5 percent of the total surveyed) reported that their spouses were employed full-time (40 hours per week) off the farm. Approximately two-thirds of the spouses did not work off the farm. This percentage was about equal with that reported in the same catagory by the primary farm operator.

Where the primary farm operator and/or the spouse worked full-time, an interesting pattern emerged. In exactly one-third of these cases, both the primary farm operator and the spouse worked full-time. In another third of these cases, only the primary farm operator worked full-time. And, in the remaining one-third of the families, only the spouse worked full-time.

Sources Of Farm Income

Over one-half of the commercial fruit and vegetable growers surveyed received 100 percent of their total 1986 farm income entirely from their produce enterprises. Table 3-3 shows the distribution of the share of total 1986 farm income received by growers from produce crops. Four growers received none of their farm income from produce in 1986. This could be due to one of three reasons: 1) They did not grow produce in

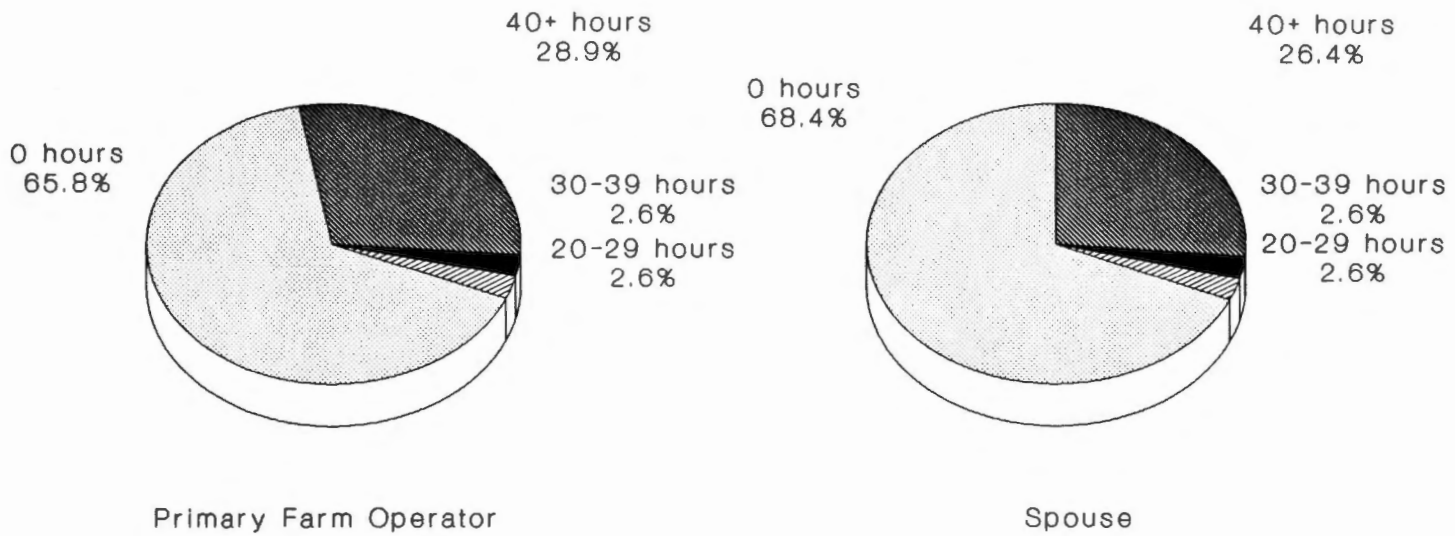

Figure 3-1. Time spent weekly in off-farm employment by 38 commercial fruit and vegetable growers in lower East Tennessee, as reported in 1987.

Table 3-3. Share of 1986 total farm income received from produce crops by 38 commercial fruit and vegetable growers in Tennessee, as reported in 1987.

Share of Total Farm Income Received From Produce (percent)	Growers n[a]	%
0	4	10.5
1-24	6	15.8
25-49	0	-
50-74	3	7.9
75-99	3	7.9
100	22	57.9
Total	38	100.0

[a]n refers to the number of growers

1986 but did in 1987 and, therefore, were included in the population from which the sample to be interviewed was drawn. 2) Their produce crop had no marketable yield in 1986 due to adverse weather conditions, ie., an early frost, or an insect/disease problem. 3) Although their produce crop was planted in 1986 or a prior year, it was too young to bear fruit in 1986.

The majority of the 38 commercial fruit and vegetable producers surveyed received none of their 1986 farm income from crops other than fruits or vegetables (Table 3-4). These other crops included tobacco, field corn, forage crops, and the sale of horticultural plants.

Table 3-5 shows the complete distribution of the share of total farm income received from all crops in 1986. Sixty percent of the growers

Table 3-4. Share of 1986 total farm income received by 38 commercial fruit and vegetable growers in Tennessee from crops other than produce, as reported in 1987.

Share of Total Farm Income Received From Crops Other Than Produce (percent)	Growers n[a]	%
0	31	81.6
1-24	1	2.6
25-49	3	7.9
50-74	0	-
75-99	3	7.9
100	0	-
Total	38	100.0

Table 3-5. Share of 1986 total farm income received from all crops by 38 commercial fruit and vegetable growers in Tennessee, as reported in 1987.

Share of Total Farm Income Received From Crops (percent)	Growers n[a]	%
0	4	10.5
1-24	3	7.9
25-49	0	-
50-74	4	10.5
75-99	4	10.5
100	23	60.5
Total[b]	38	99.9

[a]n refers to the number of growers
[b]Due to rounding error, percentage does not total to 100.

interviewed received their entire 1986 total farm income from crops only. Ten percent received no farm income from any type of crop.

Table 3-6 shows the distribution of total 1986 farm income received from livestock enterprises. One-third of the 38 commercial fruit and vegetable growers received some portion of their total farm income from livestock in 1986. Eight percent received all of their 1986 total farm income from livestock. Again, this could be due to one of three reasons: 1) They did not grow produce in 1986 but did in 1987 and were, therefore, included in the population from which the sample to be interviewed was drawn. 2) Their produce crop had no marketable yield in 1986 due to adverse weather conditions, ie., an early frost, or an insect/disease problem. 3) Although their produce crop was planted in 1986 or a prior year, it was too young to bear fruit in 1986.

Only 2.6 percent of the commercial produce growers interviewed received income from enterprises other than crops or livestock (Table 3-7). This emphasizes the dependence of the growers who were surveyed upon crops and livestock. One grower depended heavily (between 75 and 99 percent) on a farm enterprise other than crops or livestock. This producer rented his farm as a source of farm income.

Age

Figure 3-2 shows the age distribution of the growers who were surveyed. Nearly 70 percent of the 38 fruit and vegetable producers interviewed were between the ages of 30 and 60 years old. Just over one-fourth of the growers were in their thirties.

Table 3-6. Share of 1986 total farm income received by 38 commercial fruit and vegetable growers in Tennessee from livestock, as reported in 1987.

Share of Total Farm Income Received From Livestock (percent)	Growers n[a]	%
0	25	65.8
1-24	3	7.9
25-49	2	5.3
50-74	3	7.9
75-99	2	5.3
100	3	7.9
Total[b]	38	100.1

[b]Due to rounding error, percentage does not total to 100.

Table 3-7. Share of 1986 total farm income received by 38 commercial fruit and vegetable growers in Tennessee from enterprises other than crops or livestock, as reported in 1987.

Share of Total Farm Income Received From Other Enterprises (percent)	Growers n[a]	%
0	37	97.4
1-24	0	-
25-49	0	-
50-74	0	-
75-99	1	2.6
100	0	-
Total	38	100.0

[a]n refers to the number of growers

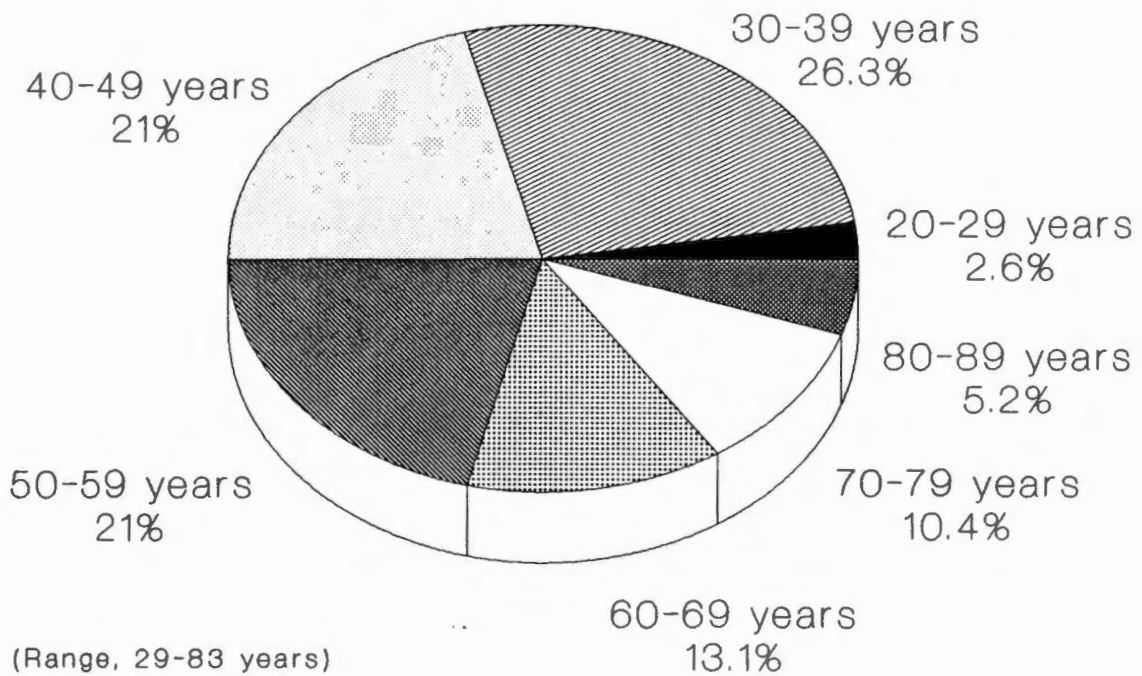

Figure 3-2. Age distribution of 38 commercial fruit and vegetable growers in lower East Tennessee, as reported in 1987.

Education

Figure 3-3 shows the distribution of the years of formal education received by the 38 growers who were surveyed. While approximately 58 percent of the commercial fruit and vegetable growers finished high school, over 40 percent did not. Roughly 20 percent dropped out after the 7th or 8th grade. Eleven percent received no formal education after the 6th grade.

Farming experience

Figure 3-4 shows the farming experience of those commercial fruit and vegetable growers who were interviewed in the study area. Half of the producers have over 25 years experience in farming. Seventy-five percent have been farming for more than 15 years. Only five percent have been farming for five years or less.

Family

Table 3-8 shows the ratio of married to single farm operators interviewed. Approximately 90 percent of the producers surveyed were married.

Table 3-9 shows the number of family members involved with the commercial production of fruits and vegetables in the study area. Over 70 percent of the primary farm operators interviewed said that at least one other family member, besides themselves, was involved in the commercial production of fruits and vegetables. Over 40 percent reported that at least two other family members were involved in their produce operation. Nearly one-fifth, 18.4 percent, reported that five or more family members helped in the commercial activities of the farm.

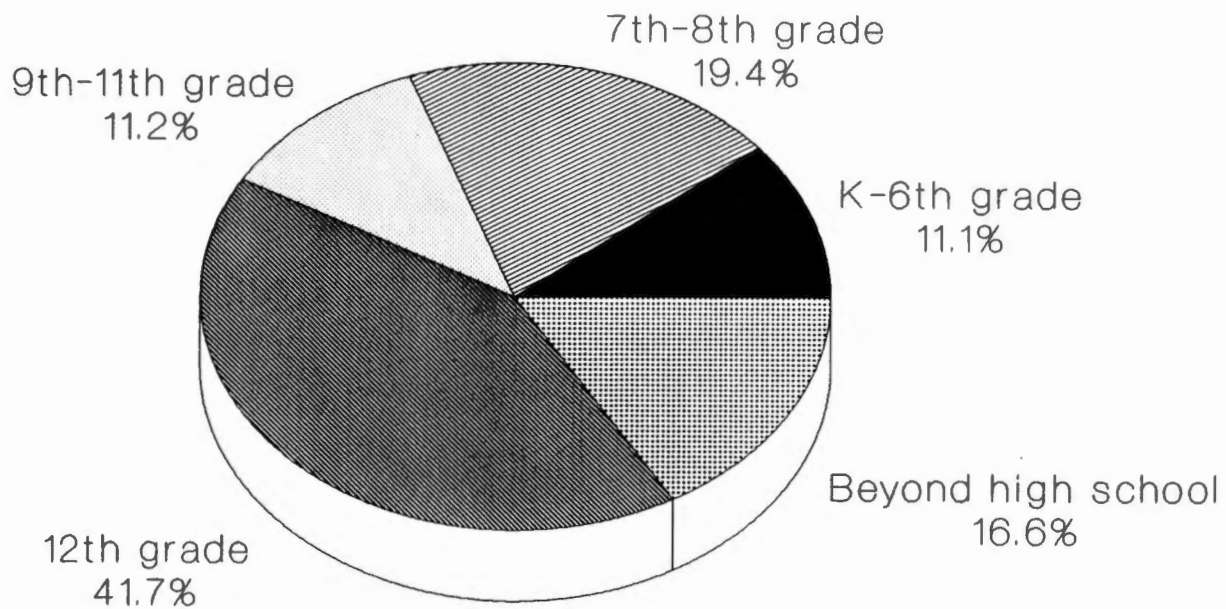

Figure 3-3. Formal education received by 38 commercial fruit and vegetable growers in lower East Tennessee, as reported in 1987.

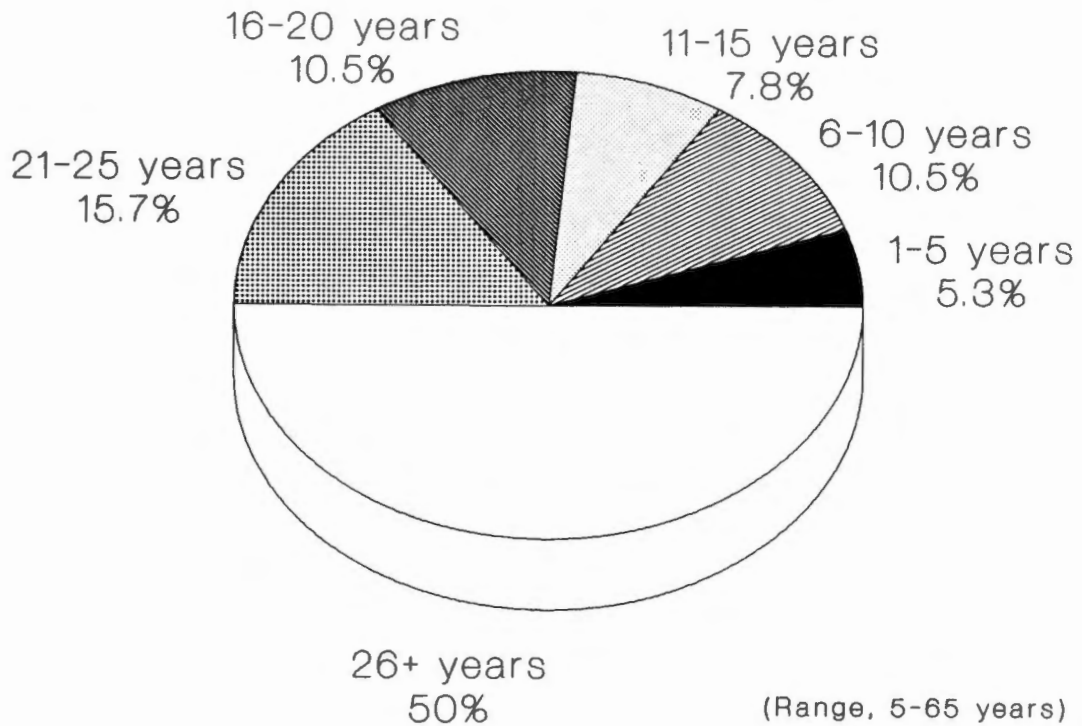

Figure 3-4. Years farming experience of 38 commercial fruit and vegetable growers in lower East Tennessee, surveyed in 1987.

Table 3-8. Marital status of 38 commercial fruit and vegetable growers in lower East Tennessee, as reported in 1987.

Marital Status	Percentage of Producers
Married	89.5
Single	10.5

Table 3-9. Number of family members involved with commercial production, as reported by 38 fruit and vegetable growers in lower East Tennessee in 1987.

Number of Family Members Involved	Percentage of Growers
1	28.9
2	28.9
3	10.5
4	13.2
5+	18.4
Total[a]	99.9

[a]Due to rounding error, percentage does not total to 100.

Hired Labor

Although the majority of the 38 growers who were surveyed involved their family in the produce operation, approximately 60 percent still hired nonfamily labor (Table 3-10). Nearly 60 percent of the growers used hired labor in harvesting their crop. Thirty-four percent used labor to

Table 3-10. Use of hired labor by 38 Tennessee commercial fruit and vegetable growers in the production, harvest, and sale of produce as reported in 1987.

Use	Producers Using Hired Labor	
	n	%
Production	13	34.2
Harvesting	22	57.9
Sales	1	2.6
Total	23	60.5[a]

[a]n refers to the number of growers

[b]This is the total percentage of growers using hired labor for any purpose. It does not equal the sum of the three individual uses of labor as one grower may make use of hired labor in more than one category.

aid in production. Only one grower who was interviewed hired nonfamily labor to sell produce.

Source and Use of Farmland

Table 3-11 shows the source and use of farmland in the study area. Thirty-seven of the 38 growers surveyed owned at least a portion of the land that they farmed. The average number of acres owned was 152.5 with a maximum of 1,006 acres owned by one grower. Seventeen of the 38 producers interviewed rented farmland. The mean number of acres rented was 100.4 with a maximum of 600 acres rented by one producer. Each grower planted an average of 89 acres and used an average of 165.8 acres for either pasture or range.

Table 3-11. Source and use of farmland in 1986 by 38 commercial fruit and vegetable growers in Tennessee, as reported in 1987.

	Source of Acreage		Use of Acreage	
	Acres			
	Owned	Rented	Planted	Range/Pasture
n[a]	37	17	38	19
Range	0 - 1,006	0 - 600	1 - 800	0 - 310
Average	152.2	100.4	89.0	165.8
Standard Deviation	244.6	151.0	165.8	100.4

[a]n refers to the number of growers

Diversity And Extent of Production

The second objective of this study was to ascertain the diversity and extent of commercial production in the study area. A broad range of both fruits and vegetables were produced in the study area in 1986 and 1987. Table 3-12 shows the acreages of commercial produce crops grown during 1986 and 1987. It also shows the percentage change in production from 1986 to 1987. Table 3-13 gives the average yield for each crop reported grown in the study area in 1986.

Vegetables

In 1986, 26 of the commercial producers surveyed grew vegetables. The number of acres of vegetables grown ranged from 0.7 to 300 acres with a mean of 35.7 acres. Twenty-eight of the growers interviewed grew vegetables in 1987. Vegetable acreage planted by one producer ranged from

Table 3-12. Acreages of crops planted in the study area for the 1986 and 1987 growing seasons as reported by 38 commercial fruit and vegetable growers in Tennessee, 1987.

Crop	Acreage						Percentage change from 1986 to 1987	
	1986			1987				
	n[a]	average	range	n[a]	average	range	n[a]	average
Vegetables:								
Bell peppers	4	23.9	0.75 - 85	9	17.9	0.25 - 60	+125	- 25
Cabbage	3	21.25	0.75 - 60	4	47.4	0.75 - 150	+ 33	+123
Cantaloupe	3	1.1	0.10 - 3	3	2.1	0.10 - 6	-	91
Cucumbers	2	0.7	0.50 - 1	1	0.5	-	- 50	- 29
Indian corn	0	-	-	1	2.0	-	-	-
Irish potatoes	4	6.0	0.25 - 15	4	5.7	0.25 - 15	0	0
Okra	1	0.5	-	1	0.5	-	0	0
Pimento peppers	11	37.3	1.50 - 300	11	34.5	1.0 - 200	0	- 8
Pumpkins	6	25.2	12.0 - 60	7	24.1	5.50 - 60	+ 17	- 5
Snapbeans	4	0.4	0.25 - 1	3	0.25	-	- 25	- 38
Squash	1	1.0	-	3	10.7	7.0 - 15	+200	+970
Sweet corn	4	10.9	1.5 - 25	3	14.8	1.5 - 25	- 25	+ 36
Sweet potatoes	2	35.7	1.5 - 70	2	39.0	3.0 - 75	0	+ 9
Tomatoes	13	14.3	0.25 - 65	13	14.7	0.25 - 65	0	+ 3
Watermelon	4	6.3	0.10 - 20	4	3.6	0.10 - 8	0	- 43
Total vegetables	26	35.7	0.7 - 300	28	40.2	0.65 - 265	+ 8	+ 13

Table 3-12 continued.

Crop	Acreage						Percentage change from 1986 to 1987	
	1986			1987				
	n[a]	average	range	n[a]	average	range	n[a]	average
Fruits:								
Apples	9	8.8	1.0 - 25	9	8.8	1.0 - 25	0	0
Blueberries	1	0.25	-	1	0.25	-	0	0
Cherries	1	1.5	-	1	1.5	-	0	0
Grapes	1	3.0	-	2	3.5	3.0 - 4	+100	+ 17
Nectarines	1	2.0	-	1	2.0	-	0	0
Peaches	2	36.0	2.0 - 70	2	36.0	2.0 - 70	0	0
Plums	1	2.0	-	1	2.0	-	0	0
Raspberries	1	3.5	-	1	3.5	-	0	0
Strawberries	1	1.0	-	1	1.0	-	0	0
Total fruits	12	13.7	1.0 - 83	12	14.0	1.0 - 83	0	+ 2
Total produce	37	33.7	0.65 - 300	37	39.5	0.65 - 265	0	+ 17

[a]n refers to the number of growers

Table 3-13. Average 1986 crop yields reported in 1987 by 38 commercial fruit and vegetable growers in Tennessee.

Crop	n[a]	Yield/Acre average	Yield/Acre range
Vegetables:			
Bell peppers	3	2.45 ton	0.8 - 3.4
Cabbage	2	17,250 lb.	12,000 - 22,500
Cantaloupe	2	1,650	1,500 - 1,800
Cucumbers	1	60 bu.	-
Indian corn	-	-	-
Irish potatoes	3	144.7 ton	104.2 - 180
Okra	1	100 lb.	-
Pimento peppers	9	2.6 ton	0.8 - 4.0
Pumpkins	3	7.3 ton	6.0 - 8.3
Snapbeans	1	87.5 bu.	-
Squash	-	-	-
Sweet corn	3	63.8 bu.	43.8 - 100
Sweet potatoes	2	187.5 bu.	125 - 250
Tomatoes	7	239.1 bu.	129.9 - 398.6
Watermelons	3	0.51 ton	0.4 - 0.6
Fruits:			
Apples	5	160.2 bu.	0 - 375
Blueberries	-	-	-
Cherries	-	-	-
Grapes	-	-	-
Nectarines	-	-	-
Peaches	1	27.5 bu.	-
Plums	-	-	-
Raspberries	-	-	-
Strawberries	1	2500 qt.	-

[a]n refers to the number of growers who produced a crop in 1986 and reported a yield for that crop.

0.65 to 265 acres in 1987 with a mean of 40.2 acres. Both the number of commercial vegetable producers and the average acres grown by each vegetable producer increased from 1986 to 1987.

Fourteen different vegetable crops were grown in the study area in 1986. They were: bell peppers, cabbage, cantaloupe, cucumbers, Irish potatoes, okra, pimento peppers, pumpkins, snapbeans, squash, sweet corn, sweet potatoes, tomatoes, and watermelon. One additional vegetable crop, Indian corn, was grown in 1987.

According to the producers surveyed, the most prevalent commercial vegetable crop grown in the study area was tomatoes. Thirteen of the 38 producers interviewed planted tomatoes in both 1986 and 1987. The average number of acres grown in 1986 was 14.3 with a range of 0.25 to 65 acres. The reported average yield per acre of tomatoes in 1986 for the study area was 239.1 bushels. Yields ranged from 129.9 to 398.6 bushels per acre. In 1987 average acreage grown rose slightly to 14.7 while the number of tomato producers and the range of acreage grown remained the same.

Pimento peppers were the second most commonly grown vegetable for commercial use in the study area in both 1986 and 1987. There were 11 producers who grew pimento peppers during both years. However, the average number of acres grown dropped from 37.3 in 1986 to 34.5 in 1987. The maximum number of acres grown by any one producer also fell from 300 in 1986 to 200 in 1987. Yields in 1986 ranged from 0.8 to four tons per acre with an average yield of 2.6 tons per acre.

In 1986, pumpkins were the third most predominant vegetable crop grown among the producers in the study area. Six producers grew an average of 25.2 acres of pumpkins in 1986 with an average yield of 7.3

tons per acre. Yields reported in the study area ranged from six to 8.3 tons per acre. The number of acres grown by any one producer ranged from 12 to 60 acres.

Bell peppers were one of the fourth most commonly grown vegetable crops in the study area in 1986. Four of the growers interviewed planted an average of 23.9 acres of bell peppers in 1986. Acreage grown per farm of bell peppers ranged from 0.75 to 85 acres. The average yield per acre of bell peppers in 1986 was 2.45 tons with a range of 0.8 to 3.4 tons. In 1987, the number of producers growing bell peppers increased 125 percent to nine producers.

In 1987 bell peppers became the third most common vegetable crop grown and pumpkins the fourth most prevalent. The mean acreage of bell peppers grown fell 25 percent to 17.9 acres in 1987. The mean acreage of pumpkins grown also fell slightly, five percent, in 1987.

In 1986 four other crops tied with bell peppers as the fourth most common vegetable crop produced in the study area. They were Irish potatoes, snapbeans, sweet corn, and watermelons. Each of these vegetables was grown by four of the 38 producers who were interviewed.

The average number of acres per farm of Irish potatoes grown in 1986 was six and ranged from 0.25 to 15 acres. Yields reported in the study area ranged from 104.2 bushels to 180 bushels with an average of 144.7 bushels per acre. In 1987, both the number of Irish potato growers and the range of acres grown remained identical to that of 1986. However the mean number of acres of Irish potatoes grown fell to 5.7 in 1987.

Each of four producers interviewed grew an average of 0.4 acres of snapbeans in 1986. The maximum acreage of snapbeans grown by one producer

in 1986 was one acre. Only one snapbean producer interviewed reported a yield in 1986 - 87.5 bushels/acre. In 1987 only three of the 38 growers surveyed grew snapbeans with a decrease of 38 percent in the mean number of acres grown.

Sweet corn was also grown in 1986 by four of the 38 producers interviewed. The average number of acres of sweet corn grown per farm was 10.9 and ranged from 1.5 to 25 acres. Three of the four producers reported yields of sweet corn which ranged from 43.8 to 100 bushels per acre with an average yield of 63.8 bushels per acre. In 1987, the number of growers involved in sweet corn production fell 25 percent among those surveyed in the study area. The mean number of acres of corn grown increased 38 percent to 14.8 acres.

Four of the 38 surveyed growers planted watermelons in 1986. Acreage ranged from 0.1 to 20 acres with a mean of 6.3 acres being grown. Reported yields in 1986 ranged from 0.4 to 0.6 tons per acre with an average yield of 0.5 tons per acre. In 1987, the mean number of acres of watermelons grown fell 43 percent to 3.6 acres. The range of acres of watermelons grown by any one producer narrowed to 0.1 to eight acres in 1987.

In 1986, cabbage was planted by three of the 38 producers interviewed. Mean acreage grown was 21.25 acres with a range of 0.75 to 60 acres. Two cabbage producers reported their yields in 1986 as 12,000 pounds and 22,500 pounds per acre. The number of cabbage producers in the study area increased by one in 1987. Mean acreage jumped to 47.4 acres in 1987, an increase of 123 percent. The maximum number of acres grown by a single cabbage producer rose from 60 in 1986 to 150 in 1987.

Cantaloupe was also grown by three of the surveyed growers in 1986. Mean acreage grown was 1.1 acres with a range of 0.1 to three acres. Yields were given by two of the three producers. The two yields given were 1,500 and 1,800 cantaloupes per acre. In 1987, mean acreage grown per farm rose to 2.1 acres. The maximum acreage of cantaloupe grown increased to six acres.

Two of the 38 commercial producers interviewed grew cucumbers in 1986. Acreage planted ranged from 0.5 to one acre. Only one grower reported their cucumber yield - 60 bushels per acre. In 1987 one producer planted cucumbers in the study area for a total of 0.5 acres grown.

Sweet potatoes were also grown by two producers in 1986. Acres grown ranged between 1.5 and 70 with a mean of 35.7 acres. One grower received a yield of 125 bushels per acre. In 1987 the same number of growers were involved with sweet potato production. Acres planted in 1987 ranged from three to 75 with a mean of 39 acres per farm.

One acre of squash was planted in 1986 by one of the 38 growers surveyed. No yield was reported. In 1987, three of the 38 producers grew squash. Mean acreage per farm was 10.7 with a range of seven to 15 acres planted. Okra was also grown by one producer in both 1986 and in 1987. In 1986, none of the producers grew Indian corn. In 1987, one grower planted two acres of Indian corn.

Fruit

In both 1986 and 1987, 12 of the 38 producers interviewed grew a fruit crop for commercial sale. Acreage of fruit crops grown in 1986 ranged from one to 83 acres with a mean of 13.7 acres. In 1987, mean

acreage per farm of fruits grown rose slightly to 14 while the range of acreage grown by any one producer remained the same.

Nine different fruit crops were grown in the area surveyed in both 1986 and 1987. They were: apples, blueberries, cherries, grapes, nectarines, peaches, plums, raspberries, and strawberries. Apples were by far the most common fruit grown in the study area during both years. This fruit was grown by nine of the 38 producers who were surveyed. In 1986 and 1987 the mean orchard size was 8.8 acres and ranged from one to 25 acres. Yields in 1986 ranged from zero to 375 bushels per acre with an average yield of 160.2 bushels of apples per acre.

Peaches were the second most prevalent fruit crop grown. Two producers grew peaches in both 1986 and 1987. Orchard size ranged from two to 70 acres with a mean of 36 acres. One grower reported a per acre yield of 27.5 bushels of peaches. In 1986 three acres of grapes were grown by one of the 38 producers interviewed. In 1987, one other grower planted four acres of grapes. In both 1986 and 1987 each of the following fruits were grown by only one of the 38 producers who were interviewed: blueberries (0.25 acres), cherries (1.5 acres), nectarines (two acres), plums (two acres), raspberries (3.5 acres), and strawberries (one acre). A 1986 yield was reported for only one of these fruits - strawberries. The strawberry producer received a yield of 2500 quarts per acre.

Factors Limiting Production

Each of the 38 producers interviewed was asked to name and rank the factors that he/she felt limited his/her commercial production. Table 3-14 shows the percentage of growers ranking each factor as the first, second, or third limitation to their production.

Table 3-14. Ranking of factors limiting production by 38 Tennessee commercial fruit and vegetable growers surveyed in 1987.

Limiting Factor	Producer Ranking of Limiting Factors					
	First		Second		Third	
	n[a]	%	n[a]	%	n[a]	%
Weather	19	52.8	3	8.3	7	19.4
Prices received	5	13.9	1	2.8	2	5.6
Disease	4	11.1	13	36.1	5	13.9
Labor	3	8.3	4	11.1	5	13.9
Insects	2	5.6	5	13.9	8	22.2
Debt level	1	2.8	4	11.1	-	-
Land	1	2.8	1	2.8	2	5.6
No markets	1	2.8	1	2.8	-	-
Equipment	-	-	1	2.8	-	-

[a]n refers to the number of growers

By far, weather was considered to be the most limiting factor to production in the study area. Nineteen producers (52.5 percent) ranked weather as the most limiting factor to their production. Weather was named as either the first, second, or third factor limiting production by at least 75 percent of the producers interviewed.

Prices received was named by five growers as the greatest limitation to production. Four producers ranked disease as the first constraint limiting their production. However, 13 producers (36.1 percent) named disease as the second most limiting factor to production. Labor (quality/availability) was listed by three growers as the most limiting factor in commercial production. Twelve of the 38 producers named labor as either the first, second, or third limiting factor to their production.

Fifteen growers (41.7 percent) listed insects as a limitation to production. Only five growers mentioned their debt levels as being a factor in limiting production.

Producer Behavior Regarding Risk Management and Marketing

Use of Risk Management Practices

All agricultural producers face great risk and uncertainty (variability) from sources both on and off the farm. On-farm sources of risk and uncertainty include yield uncertainty due to weather, disease, insects, or natural disasters and management uncertainty due to operator age, poor health, or death. Off-farm sources of risk and uncertainty take in price and income uncertainty due to the complex nature of the agricultural industry, business cycles, inflation, supply shortages, changes in tastes and income, and population growth. Other off-farm sources of risk and uncertainty include uncertainty due to new technology and its effects on productivity, harvest time, and labor requirements. Government actions in regard to agricultural programs or regulations on environmental impacts from agricultural practices are also a source of risk and variability.

In order for the farm enterprise to survive, to reduce risk and variability over time, and to assure a minimum level of income to meet fixed business and family expenses, the farm operator may prefer to reduce risk and uncertainty. There are a number of methods that agricultural producers can use to lower the risk and uncertainty associated with farming. These methods include enterprise diversification, spreading sales, production contracts, and obtaining market information.

Table 3-15 shows the responses of the 38 surveyed commercial fruit and vegetable producers to risk and variability. The most common method of dealing with risk and uncertainty for these growers was the spreading of sales. Twenty-three (60.5 percent) of the producers interviewed used frequent sales to help stabilize prices and to approach the average price during the marketing period. Of the growers who employed this method, 69.6 percent ranked it as very important, 10.5 percent rated it as important, and 13.0 percent listed this method as unimportant to their business. Producers who spread their sales used three strategies. One approach was to stagger plantings of the same variety. Another was to plant varieties that would mature at different times. A third strategy was to employ a combination of the first two methods.

Another approach common to the surveyed growers who attempted to reduce their risk and uncertainty was enterprise diversification. Twenty-one (55.3 percent) of the growers interviewed were involved in the production of more than one type of farm enterprise. This allowed these commercial growers to spread risk and to stabilize their total returns. Of those producers who diversified, 76.2 percent ranked enterprise diversification as very important to their business undertakings. Only 9.5 of those using this method ranked it as unimportant to their operation. Several strategies were employed by the producers who used enterprise diversification. Each method allows for crop or livestock market failure without resulting in financial disaster for the farmer. One approach was to grow more than one type of produce crop. If one produce enterprise failed, for whatever reason, the farmer could still usually count on positive returns from the other. Another tactic was to

Table 3-15. Management responses to risk and variability by 38 commercial fruit and vegetable growers in Tennessee, as reported in 1987.

Method of Lowering Risk and Uncertainty	Producers Using This Method		Percentage of Producers Ranking This Method:		
	n[a]	%	Very Important	Important	Not Important
Spreading Sales	23	60.5	69.6	17.4	13.0
Enterprise Diversification	21	55.3	76.2	14.3	9.5
Market Information	19	50.0	47.4	42.1	10.5
Contract Production	14	36.8	71.4	28.6	0.0

[a]n refers to the number of growers

grow other crops in addition to produce crops (ie., soybeans, tobacco). Raising livestock was another option for the producers who were interviewed. All possible combinations of the previously mentioned diversification strategies were used by one or more of these growers.

Nineteen of the 38 growers who were interviewed actively obtained market information to facilitate the sale of their crops. These commercial producers used one or more of four methods to secure outlook information and reports on market conditions that would add to their knowledge of expected prices. One way of obtaining market information was for the producer to call and ask buyers what they were looking for in a specific produce item and what prices they were offering. Similarly, growers actively contacted other growers to find out what market outlets were moving produce quickly and where the good (high) prices were. Another method used by producers to gain market information was by reading published market reports. A fourth way of securing market information was to simply receive it through the proverbial grapevine - by word of mouth from other market participants (both growers and buyers). Less than half, 47.4 percent, of those growers who obtained some type of market information felt that it was very important to their produce enterprise. Another 42.1 percent ranked their search for market information as important while 10.5 percent said that it was unimportant to them as a producer.

A fourth strategy for dealing with risk and uncertainty is the use of a production contract. Fourteen (36.8 percent) of the producers interviewed had contractual agreements with buyers that specified price and other aspects of commodity delivery. Of those using production

contracts, ten growers (71.4 percent) ranked this method as being very important to their business. All of the growers who used production contracts to lower risk and uncertainty considered this method important, if not very important, to their commercial operation. Thirteen of the fourteen producers who used production contracts were pimento pepper producers. These growers contracted with a processor, ie., Nabisco, to sell their crop. In the spring, the processor provided the growers with plants (at cost) and offered them a price per ton for their future harvest. The buyer (processor) also specified the quality of the peppers that they would purchase from the farmer. The growers were allowed to wait and pay for their plants after their first crop has been harvested and sold. Although plants, price, and quality are taken care of in these agreements, problems can still arise for the producer. Two growers mentioned that they had received disease carrying plants from the processor. Time and other valuable inputs supplied by the producer had been spent on plants that had either died or had given no significant yield. Not only was their expected yield greatly reduced, the growers were still required to pay for all the plants that they had received. Another problem that was mentioned was that contracts were not always renewed from year to year, leaving the producer in an uncertain position.

Preparation of Produce For Marketing

Uniformity of quality and size is necessary for efficient marketing of commercial produce. Large buyers often stipulate size and quality standards that must be met before they will purchase an item. The 38 surveyed growers were asked what methods they used to prepare their produce for the marketplace. Table 3-16 shows the response of these

Table 3-16. Preparation of produce for marketing by 38 commercial fruit and vegetable growers in Tennessee, as reported in 1987.

Type of Preparation	Growers n[a]	%
Grade to meet their own standards	12	31.6
Size according to U.S.D.A. standards	10	26.3
Grade and pack as specified by buyer	10	26.3
Buyer grades and sizes produce	9	23.7
Grade according to U.S.D.A. standards	8	21.1
Sell as field-run (mixed grade/size)	6	15.8

[a]n refers to the number of growers

growers to this question. Twelve (31.6 percent) of these producers graded their produce to meet their own standards. An often heard comment among these growers was, that if they maintained a higher quality of produce than their competition, buyers would come back a second time. Only ten producers (26.3 percent) sized their produce according to U.S.D.A. standards and less than a fourth, 21.1 percent, conformed to U.S.D.A. standards in grading their produce. In ten cases the grower graded and packed his/her produce to meet buyer specifications. Nine producers sold their crop to buyers who then graded and sized the produce themselves.

Six of the growers surveyed sold field-run (mixed grades and sizes) produce.

Market Outlets

Table 3-17 shows the market outlets used in 1986 by the 38 commercial produce growers who were interviewed in 1987. Collectively these growers channeled their produce through at least twelve different market outlets. Producers sold their crop through wholesalers in Atlanta, Chattanooga, Knoxville, Nashville, and other areas. Ten growers (29.4 percent) dealt with wholesalers outside the Atlanta, Chattanooga, Knoxville, and Nashville regions. Two producers sold their produce to a retailer in Chattanooga. None of the growers who were interviewed marketed produce through Atlanta, Knoxville, or Nashville retail outlets. Eight producers (21.0 percent) sold to retailers in areas other than Atlanta, Chattanooga, Knoxville, or Nashville. Farmers' markets in Atlanta, Chattanooga, and Nashville served as outlets for seven producers. No farmers' markets in Knoxville were used by the growers who were surveyed in the study area. Thirteen producers (34.2 percent) sold their crop to a processor. Five commercial growers used market outlets other than those previously mentioned.

Producer Reaction To Market Prices

Table 3-18 shows the attitude of the 38 interviewed producers toward prices offered by buyers at various market outlets. Comparisons were made between the wholesale markets, farmers' markets, and PYO operations. Four producer reactions were noted. Not every producer who used these markets responded to this question. Therefore, the numbers or percentages of

Table 3-17. Market outlets used in 1986 by 38 commercial fruit and vegetable growers in Tennessee, as reported in 1987.

Market Outlet	Producers Using Outlet n[a]	%
Atlanta		
Wholesaler	1	2.9
Retailer	-	-
Farmers' Market	3	8.8
Chattanooga		
Wholesaler	3	8.8
Retailer	2	5.9
Farmers' Market	3	8.8
Knoxville		
Wholesaler	1	2.9
Retailer	-	-
Farmers' Market	-	-
Nashville		
Wholesaler	4	11.8
Retailer	-	-
Farmers' Market	1	2.9
Other		
Wholesaler	10	29.4
Retailer	8	21.0
Farmers' Market	-	-
Processor	13	38.0
Other outlet	5	14.7

[a]n refers to the number of growers

Table 3-18. Attitude of 38 commercial fruit and vegetable growers in Tennessee toward prices offered by buyers at various market outlets, as reported in 1987.

Reaction of Producer	Market Outlet					
	Wholesaler		Farmers' Market		PYO	
	n[a]	%	n[a]	%	n[a]	%
Must accept the price that is offered	3	33.3	-	-	-	-
Compare with comments of other growers	5	55.5	5	62.5	2	66.7
Compare with published Atlanta wholesale prices	1	11.1	1	12.5	-	-
Set their own price	-	-	2	25.0		33.3
Total	9	99.9[b]	8	100.0	3	100.0

[a]n refers to the number of growers

[b]Due to rounding error, percentage does not total to 100

producers giving a particular response should be viewed only in the context of the total number of producers responding to this question.

In the wholesale markets, the producer has less power than in either the farmers' markets or in the PYO situation. This could help explain why only producers who dealt with a wholesaler felt that they had no choice and must accept the price offered to them by the buyer. Three growers (33.3 percent) took this view. The majority of growers who sold through any of the three market outlets compared the price offered with comments from other growers (pertaining to the prices they received in

similar situations). Five producers selling to wholesalers responded in this manner, as did five of those who sold through a farmers' market. Two growers who maintained a PYO operation compared the price offered by the buyer with comments from other growers. Two producers who sold through farmers' markets stated that they, the producer, set their own price in this marketplace. One grower who ran a PYO enterprise set his/her own price. None of the growers who sold produce through a wholesaler reacted in this manner. One producer who marketed his/her produce through a wholesaler compared the buyers price with published Atlanta wholesale prices. One grower dealing with a retailer also responded in this manner.

Market Performance

In addition to examining producer behavior regarding the use of market outlets, a fourth objective of this study was to analyze the performance of existing market outlets and packing facilities used by producers in the study area.

Prices Received

An oft-heard complaint among agricultural producers is that they receive below-cost prices for their products. Table 3-19 shows the opinion of 33 commercial fruit and vegetable growers in the study area who responded to the question, "For your top two produce commodities, do you think the prices you received in 1986 were fair (equitable) prices?" Twenty-five growers (75.8 percent) responded positively, saying yes, they did receive a fair price for their most important crop. Fourteen producers grew more than one crop and responded to the same question. Of those producers, 85.7 percent said that they had received a fair price for

Table 3-19. Opinion of 38[a] commercial fruit and vegetable growers in Tennessee regarding prices received for major crops in 1986, as reported in 1987.

Crop	Did you receive a fair price?			
	Yes		No	
	n[b]	%	n[b]	%
Most important crop	25	75.8	8	24.2
Second most important crop	12	85.7	2	14.3

[a]Although 38 producer were interviewed, only 33 responded to this question. Percentages are based on the number of respondents, not on the number of producers interviewed.

[b]n refers to the number of growers

their second most important crop. The fact that these producers feel that they are receiving a fair price for their commodities would help provide incentive for them to remain in the commercial produce business.

Quality of Locally Grown Produce

Table 3-20 shows how the 38 commercial fruit and vegetable growers interviewed perceive the quality of locally grown produce (in comparison to produce from other origins) available at local retail grocery stores. Growers were asked to rank the quality of five different produce items: tomatoes, cabbages, broccoli, apples, and peaches. In each case, the majority of the producers interviewed ranked the quality of the locally grown product as superior to that from other areas.

Table 3-20. Perception of the quality of locally grown produce (in comparison to produce from other origins) by 38 commercial fruit and vegetable growers in Tennessee, as reported in 1987.

Produce Item	Percentage of Producers Ranking Item			
	Better	Worse	Same	Do not know
Tomatoes	78.9	2.6	0	18.4
Cabbages	73.7	2.6	2.6	21.1
Broccoli	65.8	2.6	2.6	28.9
Apples	68.4	2.6	5.3	23.7
Peaches	65.8	2.6	5.3	26.3

Tomatoes. Thirty growers (78.9 percent) ranked the quality of locally grown tomatoes as better than those grown elsewhere. Only 2.6 percent of the producers rated their quality as worse, while seven growers said that they had no basis from which to make a decision.

Cabbage. The quality of locally grown cabbage was rated as "better" by 73.7 percent of the producers interviewed. One grower felt that the quality of cabbage grown locally was the same as that from other regions. Only one said that it was worse in comparison.

Broccoli. Broccoli grown locally received a slightly different ranking. Twenty-five (65.8 percent) of the 38 producers surveyed believed that the quality of locally grown broccoli available in retail stores was superior to that grown elsewhere. Eleven growers stated that they had no basis by which to judge the quality of locally grown broccoli against that from other sources.

Apples. Twenty-six (68.4 percent) of the growers interviewed rated locally grown apples to be of a better quality than those from other origins. Nine producers stated that they did not know whether or not locally grown apples were of a higher quality.

Peaches. Nearly two-thirds (65.8 percent) of the producers surveyed believed that local peaches were a better quality item than those grown elsewhere. Ten growers acknowledged that they had no basis by which to judge the quality of local peaches versus those grown in other regions.

Comparing the Produce Industries - Tennessee, North Carolina, Georgia

The 38 commercial fruit and vegetable growers interviewed were asked to voice their opinions regarding the size of the Tennessee commercial produce industry. They were asked to compare the produce industry in Tennessee with the larger produce industries of Georgia and North Carolina. Tennessee commercial growers listed reasons why they believed that the produce industries of Georgia and North Carolina are so much larger than the produce industry in Tennessee. Table 3-21 gives the response of the producers who answered this question. Seven Tennessee producers did not express an opinion in regard to this particular question. Sixteen (42.1 percent) of the responding producers believed that Georgia has better market outlets for produce than Tennessee does. Eleven growers (28.9 percent) felt that the North Carolina industry also has better market outlets. Ten of the interviewees (26.3 percent) said that the produce industry in Georgia was larger than the produce industry in Tennessee because the weather in Georgia is more conducive to production. Seven growers (18.4 percent) made the same statement about North Carolina. Better transportation systems were listed by four

Table 3-21. Response of 38 commercial fruit and vegetable growers in Tennessee to a question asking why the produce industries of North Carolina and Georgia are so much larger than the produce industry in Tennessee, as reported in 1987.

Producer opinion	Georgia n[a]	Georgia %	North Carolina n[a]	North Carolina %
Better markets	16	42.1	11	28.9
Better weather	10	26.3	7	18.4
Better transportation system	4	10.5	4	10.5
Better assistance from the State Department of Agriculture	4	10.5	3	7.9
Better soils	3	7.9	3	7.9
Better extension service	1	2.6	1	2.6
Better experiment stations	1	2.6	1	2.6

[a]n refers to the number of growers

Tennessee growers as a partial cause for the larger produce markets in both North Carolina and Georgia. Four producers stated that commercial fruit and vegetable growers in Georgia received better assistance from their state department of agriculture. Three believed the same of those growers in North Carolina. The Tennessee producers felt that this was an attribute of the Georgia and North Carolina produce industries which made them larger than the produce industry in Tennessee. Better soils were also cited by three Tennessee growers as a reason for the larger produce

industries in both North Carolina and Georgia. Other reasons mentioned were better extension services and better experiment stations. Four Tennessee growers were of the opinion that agricultural producers in both Georgia and North Carolina are more oriented toward commercial produce farming than are agricultural producers in Tennessee -- hence the larger produce industries in these two states.

Promotion of Locally Grown Produce

During 1985 and 1986 the Marketing Division of the Tennessee Department of Agriculture began the development and use of a state logo. The purpose of this logo was to promote Tennessee products, including locally grown produce. Today, the "Pick-Tennessee-Products" logo, as seen in Appendix C, is used to market high quality locally produced products in Tennessee. It is designed to help consumers recognize Tennessee produce (and other agricultural products) in their local grocery store. Tennessee consumers purchasing Tennessee products help to maintain the rural economy of Tennessee.

Table 3-22 shows the opinions of the 38 surveyed growers regarding the state logo during its beginning stages in 1987. The majority of these Tennessee producers (73.7 percent) were not even aware of the existence of the new logo. Only 34.3 percent believed that the logo would actually help them as a producer. Half of the growers interviewed did not feel that the logo would be of benefit to them. Although the majority of the producers surveyed did not think that the Pick-Tennessee-Products logo would help them, 63.2 percent believed that it would influence shoppers to purchase locally grown produce. Twelve producers were unsure whether or not the logo would actually influence shoppers in this manner. Only

Table 3-22. Opinion of 38 commercial fruit and vegetable growers in Tennessee regarding the logo developed by the Tennessee Department of Agriculture to promote locally grown produce, as reported in 1987.

Question Concerning Tennessee Logo	Growers Answering					
	Yes		No		Not Sure	
	n[a]	%	n[a]	%	n[a]	%
Are you aware of the logo?	10	26.3	28	73.7	-	-
Will the logo help you as a producer?	13	34.3	19	50.0	6	15.7
Will the logo influence shoppers to purchase locally grown produce?	24	63.2	2	5.3	12	31.5
Do Tennessee shoppers care about the problems of local produce growers?	8	21.1	25	65.8	5	13.2

[a]n refers to the number of growers

eight of the 38 growers (21.1 percent) felt that Tennessee consumers were concerned about the problems of local (Tennessee) produce farmers. Twenty-five (65.8 percent) said that they did not believe that Tennessee consumers cared about the problems experienced by local agricultural producers.

Use and Availability of Marketing Facilities

Table 3-23 shows the response of 38 commercial fruit and vegetable growers to each of five different questions pertaining to the use and availability of farmers' markets, marketing cooperatives, and packing facilities.

Table 3-23. Opinions of 38 commercial fruit and vegetable growers in Tennessee regarding the use and availability of farmers' markets, marketing cooperatives, and packing facilities, as reported in 1987.

Question Concerning the Farmers' Market or Packing Facility	Growers Answering					
	Yes		No		Don't Know	
	n[a]	%	n[a]	%	n[a]	%
Would a new or improved farmers' market in the Chattanooga area increase your sales to urban customers?	24	63.2	10	26.3	4	10.5
Would a large state-owned farmers' market in Chattanooga be a better sales outlet for you than a smaller state-owned market in your county?	13	34.2	15	34.9	10	26.3
Have you ever sold produce through a marketing cooperative?	1	2.6	37	97.4	-	-
If you wanted to, could you have your crop packed and sold by a privately owned packinghouse operation?	28	73.7	10	26.3	-	-
Would you be interested in joining with a group of produce growers to form an association or cooperative to grade, pack, and broker your crop?	14	36.8	17	44.7	7	18.5

[a]n refers to the number of growers

Farmers' markets. The closest urban area to the eight county study area is Chattanooga. However, as seen in Table 3-17, only three of 38 producers used the farmers' market in Chattanooga. Comments were made by several growers concerning the poor location and setup, upkeep, and management of the present farmers' market in Chattanooga. The producers who were surveyed were asked if a new or improved farmers' market in this area would increase their sales to urban customers. Twenty-four growers (63.2 percent) felt that a new or improved farmers' market in Chattanooga would indeed boost their sales to urban dwellers.

Producers were also asked if a large state-owned farmers' market in Chattanooga would be a better sales outlet for them than would a smaller state-owned market in their own county. No consensus was reached among the producers with reference to this question. Thirteen growers (34.2 percent) said that a large state-owned farmers' market would be the better outlet for their sales. Fifteen producers (39.4 percent) believed that a smaller state-owned farmers' market in their own county would serve their needs more completely. As many as ten producers (26.3 percent) did not know which of these two market outlets would provide a better sales outlet for them.

Packing Facilities. Twenty-eight of the 38 producers (73.7 percent) surveyed said that there was a privately owned packinghouse available to them should they wish to have their crop packed and sold through such an operation. Ten of the growers who were interviewed stated that they did not have access to the services of a privately owned packinghouse.

Marketing cooperatives. As noted in Chapter 2 under Potential for Wholesale Marketing of Produce, cooperatives can be of considerable

assistance to commercial growers in the marketing of fresh produce. By the proper maintenance of quality, packing, and shipping standards that are required by commercial buyers, packing and marketing cooperatives can improve the competitive nature of their members.

Only one of the 38 growers interviewed had ever sold produce through a marketing cooperative. The remaining 97.4 percent had never marketed their crop through a cooperative. Each grower was asked if they would be interested in joining with a group of other producers to form an association or cooperative through which they could grade, pack, and broker their crop. Fourteen of the producers (36.8 percent) interviewed responded positively, stating that they would be interested in forming a marketing cooperative with other growers. However, a greater number of producers, 17 (44.7 percent), gave a negative response. These growers said that they were not interested in forming a marketing cooperative. They gave a variety of reasons for not wanting to be part of such an organization. The most common reason, given by five producers, was that the producer felt that he/she grew too little to make joining a cooperative worthwhile. Four growers were satisfied with their present method of marketing and saw no reason for change. Four others viewed their produce operation as a hobby. Since they derived satisfaction from dealing with consumers on a personal basis, a marketing cooperative would not serve their interests. Two producers based their "no" answer on negative comments from other growers who had experienced problems with cooperatives in the past. These producers were concerned that quality standards would not be enforced properly. They felt that their product would become mixed with that of an inferior quality, and, if sold, would

not bring as high a price as it merited. Another grower was apprehensive of joining a marketing cooperative believing that if he did, he could not be sure where his product was going or if it would even be sold. One producer did not plan to grow a commercial crop in the future and was, therefore, not interested in joining a cooperative.

CHAPTER IV

SUMMARY AND CONCLUDING REMARKS

Summary

The purpose of this study was to examine the commercial fruit and vegetable market in a selected area of Tennessee, with emphasis being placed on the supply-side of the market. Specific objectives were: 1) To identify the population of commercial fruit and vegetable growers in the study area. 2) To ascertain the diversity and extent of production. 3) To analyze producer behavior regarding the use of standardization and grading, market outlets and information, and risk management. 4) To analyze the performance of existing packing facilities and market outlets. The study revealed a number of interesting features about the commercial fruit and vegetable industry in Tennessee.

Producer Characteristics

In identifying the population of fruit and vegetable growers in the study area, several distinguishing producer characteristics were noted. The majority of the producers interviewed named their form of business as an individual proprietorship. These growers either received nearly all of their household income or a small amount of their household income from farming. Few growers were in the realm between these two extremes. Just over 30 percent of these fruit and vegetable producers received at least three-fourths of their household income from off-farm employment in 1986. Nearly 30 percent of the growers interviewed worked at least 40 hours a week working at jobs off the farm.

Over one-half of these growers derived 100 percent of their total 1986 farm incomes entirely from their produce enterprises. The majority of the 38 producers surveyed received none of their total 1986 farm income from crops other than fruits or vegetables. One-third of the interviewed growers received some portion of their total farm income from livestock in 1986.

Nearly 70 percent of the surveyed growers were between 30 and 60 years old. Half of the producers have over 25 years experience in farming. Seventy-five percent have been farming for more than 15 years. Over 40 percent of the producers interviewed did not finish high school and approximately 20 percent had no formal education past the 7th or 8th grade.

Over 70 percent of the primary farm operators surveyed said that at least one other family member was involved with the commercial production of fruits or vegetables. Even though the majority of the growers involved other family members in their produce enterprise, 60 percent still hired non-family labor. Hired labor was used primarily in the harvesting stage of production.

Thirty-seven of the 38 growers owned at least a portion of the land that they farmed. Seventeen growers rented farmland. Each producer planted an average of 89 acres and used an average of 165.8 acres for either pasture or range.

Diversity and Extent of Production

Based on the sample of growers interviewed, a wide range of both fruits and vegetable were grown in the study area during both 1986 and 1987. Both the number of vegetable producers and average vegetable

acreage grown in the study area increased slightly from 1986 to 1987. The number of fruit growers remained the same from 1986 to 1987, while fruit acreage increased only 2 percent.

Fourteen different vegetable crops were grown by 26 producers in 1986: bell peppers, cabbage, cantaloupe, cucumbers, Irish potatoes, okra, pimento peppers, pumpkins, snapbeans, squash, sweet corn, sweet potatoes, tomatoes, and watermelons. Twenty-eight producers grew these and one additional vegetable crop, Indian corn, in 1987. Tomatoes were the most commonly grown vegetable and were produced by 13 growers in both 1986 and 1987. Pimento peppers were the second most common vegetable in the study area and were grown by eleven producers.

Twelve producers grew nine different fruit crops in the study area in both 1986 and 1987. They were: apples, blueberries, cherries, grapes, nectarines, peaches, plums, raspberries, and strawberries. Apples were the most commonly grown fruit in the study area and were produced by nine growers in both 1986 and 1987. Peaches were the second most prevalent fruit crop and were grown by two producers in the study area during both 1986 and 1987.

Commercial production of fruits and vegetables in the study area was limited by nine different factors. These factors were ranked by the producers. Weather was considered by far to be the most limiting factor in their production. Prices received, diseases, available labor (quality and quantity), and insects were also named as significant factors limiting commercial production in the study area. Of notable interest was that only five of the 38 agricultural producers named debt level as a factor limiting their production.

Producer Behavior Regarding Risk Management and Marketing

The 38 surveyed growers employed four methods of risk management. Spreading sales was the most common method used by these producers to alleviate risk. Twenty-three growers (60.5 percent) used frequent sales. Nearly 70 percent of these ranked this strategy as very important to their business. Enterprise diversification was used by 55.3 percent of the producers interviewed. Seventy-six percent of those using enterprise diversification said that it was very important to their business. Nineteen growers actively obtained market information in order to facilitate their crop sales. However, less than half of these growers felt that obtaining market information was "very important" to their business. Production contracts were used by fourteen growers. The majority of these growers ranked this method as very important to their produce enterprise. Thirteen of the growers who used production contracts were pimento pepper producers.

The 38 interviewed growers used various approaches to prepare their produce for marketing. Just over a fourth of the producers used U.S.D.A. standards in sizing their produce. Only 21.1 percent conformed to U.S.D.A. grading standards.

At least twelve different market outlets were utilized by the 38 growers who were interviewed. Wholesale market outlets in Atlanta, Chattanooga, Knoxville, Nashville, and other regions were used by these growers. Retail outlets in Chattanooga and other local areas were used by the producers who were surveyed. Farmers' markets in Atlanta, Chattanooga, and Nashville were used as market outlets by growers in the

study area. Local produce was also channeled through processors and other unspecified market outlets.

Producer reaction to prices offered by buyers varied between and within types of market outlets. However, the only producers who felt that they must accept the price offered by the buyer were those producers who dealt with buyers in the wholesale market.

Market Performance

Many agricultural producers feel that they receive below-cost or unfair prices for their commodities. Surprisingly, 25 of the 38 growers (75.8 percent) interviewed said that they did receive a fair price for their most important produce crop in 1986. Of the 14 producers who grew more than one produce item, 85.7 percent said that they also received a fair price for their second most important crop.

When questioned about the quality of five different locally grown produce items available at local retail grocery stores (in comparison with the quality of those same items from other regions), the majority of the growers rated local produce as being of superior quality.

The Tennessee producers who were interviewed cited better markets and better weather as the primary reasons for the larger produce industries found in both Georgia and North Carolina.

At the time of this study, the majority of the growers surveyed (73.7 percent) were not even aware of the "Pick-Tennessee-Products" logo. Only 34.3 percent felt that the use of this logo would actually help them as a producer. However, 63.2 percent believed that the logo would influence shoppers to purchase locally grown produce.

Twenty-four (63.2 percent) of the growers interviewed believed that a new or improved farmers' market in the Chattanooga area would increase their sales to urban customers. When asked if a large state-owned farmers' market in Chattanooga would be a better market outlet than a smaller state-owned market in their own county, no consensus was reached among the interviewed producers. Seventy-four percent of the growers surveyed had access to a privately owned packing facility should they choose to use one.

Only one grower had ever sold produce through a marketing cooperative. Less than half, 36.8 percent, of the producers interviewed were interested in forming a marketing cooperative with other growers. Those growers who did not wish to join a cooperative gave definite reasons for their response.

Concluding Remarks

Although some of the commercial fruit and vegetable producers who were interviewed appeared to be satisfied with their present marketing situation, others were interested in change.

Potential for market improvements and innovations within the study area is implied through producer response to several survey questions. Improvements in grading and standardization procedures could increase the appeal of local produce to wholesale markets. If enough growers could be persuaded to form a cooperative, the market power of local producers in the marketplace could be augmented. Upgrading local marketing facilities could also improve overall market performance in the study area.

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APPENDICES

APPENDIX A

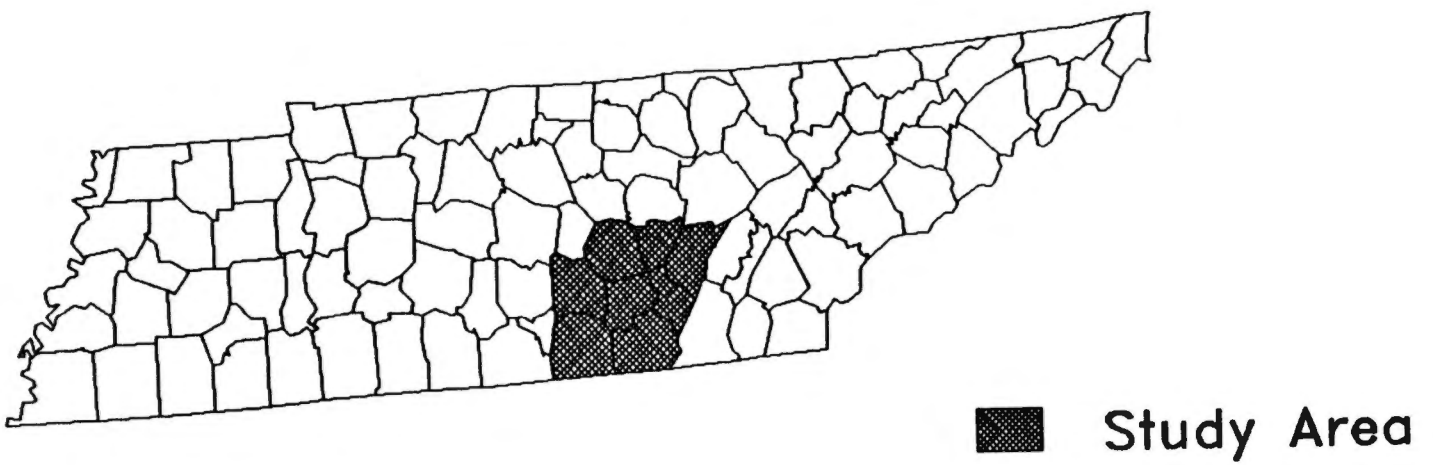

Figure A-1. Map of the study area which includes the Tennessee counties of Bledsoe, Coffee, Franklin, Grundy, Marion, Sequatchie, Van Buren, and Warren.

APPENDIX B

The University of Tennessee Institute of Agriculture

Produce Marketing Survey Questionnaire

Confidential

Date: _____ Questionnaire No. _____

Respondent:

Name _____

Address _____

_____

_____

County _____ Phone _____

Enumerator _____

CONFIDENTIAL

General Information about the Farm

Please complete or check the correct response.

Size of farm in 1986:

Acres _____ Acres cash rented _____ Acres share leased _____

Acres planted under crops and/or harvestable forage _____

Acres in pasture or range in 1987 _____

Crops grown in 1986:

Crop	Acres	Average marketable yield per acre	Acres planned for 1987

Double - or triple-cropping patterns used in 1986:

First Crop	Second Crop	Third Crop	Acres

Marketing outlets used for fruit and vegetable crop sales in 1986. (Some crops may be sold through several outlets -- use back of page if needed).

(Outlets: Jobber, broker, retailer, wholesaler, farmers' market, pick-your-own farm market, processor buying station).

Crop	Outlet	Container size	Number of containers or percentage of crop	Average price per container

Market outlets used in the past. Indicate yes or no for 1986. If not used in 1986, but used in a prior year, please indicate the most recent year.

	1986	Used in prior year (when?)
Chattanooga wholesaler	_____	_____
Chattanooga retailer	_____	_____
Knoxville wholesaler	_____	_____
Knoxville retailer	_____	_____
Nashville wholesaler	_____	_____
Nashville retailer	_____	_____
Atlanta wholesaler	_____	_____
Atlanta retailer	_____	_____
Other wholesalers	_____	_____
Other retailers	_____	_____
Chattanooga farmers' market	_____	_____
Nashville farmers' market	_____	_____
Knoxville farmers' market	_____	_____
Atlanta farmers' market	_____	_____
Ashville farmers' market	_____	_____
Processor	_____	_____
Other	_____	_____

Share of total farm income in 1986 from crops and livestock enterprises:

Crops: Fruits and vegetables	_____%
All other crops	_____%
Livestock:	_____%
Other:	_____%
Total farm income	100%

Share of total household income from farming and off-farm employment:

Farming (crop and livestock)	_____%
Off-farm employment	_____%
Other	_____%
Total household	100%

Do you use hired labor (non-family) in your fruit and vegetable production?

_____ yes _____ no

If yes, for what activities

Vegetable production _____

Harvesting vegetables _____

Selling vegetables _____

Are you aware of the logos developed by the Tennessee Department of Agriculture to help promote Tennessee produce?

_____ yes _____ no

If yes, how will the logo help you? _____

_____

How do you feel about the quality of locally grown produce available at retail grocery stores in comparison to produce from other origins?

	Local produce at retail stores is:			
	Better	Worse	Same	Do not know
Tomatoes	_____	_____	_____	_____
Cabbage	_____	_____	_____	_____
Broccoli	_____	_____	_____	_____
Apples	_____	_____	_____	_____
Peaches	_____	_____	_____	_____

Do you think the use of the Tennessee-Country Fresh logo on produce for sale in retail chain stores would influence shoppers to purchase locally produced products?

_____ yes _____ no Why? _____

_____

Do you think Tennessee food shoppers care about the problems of local fruit and vegetable growers?

_____ yes _____ no

How do you prepare your produce for marketing?

Grade according to U.S.D.A. standards _____ yes _____ no

If yes, how? _____

_____

Size according to U.S.D.A. standards _____ yes _____ no

If yes, how? _____

_____

Sell as field-run (mixed grades and sizes) _____ yes _____ no

Type of containers used _____

Grade and pack as specified by buyer _____ yes _____ no

Specify details for most important vegetable _____

_____

Do you think an improved, or new, farmers' market in the Chattanooga area would increase the sales of your produce to urban consumers?

_____ yes _____ no

When you sell your most important produce crop, _____, how do you react to the buyer's price.

	Wholesaler	Farmers' Market	PYO
Must accept what's offered	_____	_____	___
Compare to price received previous year	_____	_____	___
Compare to comments of other growers	_____	_____	___
Compare to published Atlanta wholesale prices	_____	_____	___

Other _____

_____

Would a large state-owned farmers' market in Chattanooga be a better sales outlet for you than a smaller state-owned market in your own county?

_____ yes _____ no

Have you ever sold produce through a marketing cooperative?

_____ yes _____ no

Are you currently selling produce through a cooperative?

_____ yes _____ no

If yes, please describe when and where. _____

_____

If no, why did you stop? _____

_____

If you wanted to, could you have your crop packed and sold by a privately owned packinghouse operation?

_____ yes _____ no

If yes, where? _____

Would you be interested in joining with a group of produce growers to form an association of cooperative to grade, pack, and broker your crop?

_____ yes _____ no

If no, why? _____

_____

_____

Of this list, which are the three most limiting factors in your production of vegetables? (rank 1 to 3)

Land	_____	Prices received	_____
Labor	_____	No markets	_____
Debt level	_____	Weather	_____
Equipment	_____	Other	_____
Insects	_____	Other	_____
Diseases	_____		

For your top two produce commodities, do you think the prices you received in 1986 were fair (equitable) prices?

	Crop		
1.	_____	_____ yes	_____ no
2.	_____	_____ yes	_____ no

If no, how much higher would prices need to be to be fair?

Crop 1: _____

Crop 2: _____

In your opinion, why are the fruit and vegetable industries in Georgia and North Carolina so much larger than in Tennessee? (check contributing factors)

	Georgia	North Carolina
Better weather	_____	_____
Better Extension Service	_____	_____
Better soils	_____	_____
Better transportation system	_____	_____
Better markets	_____	_____
Better Experiment Station	_____	_____
Better assistance from State Department of Agriculture	_____	_____
_____	_____	_____
_____	_____	_____

If better markets checked above, please specify what markets?

Georgia _____

North Carolina _____

For other factors checked above, please specify what you feel should be done to correct the weakness in Tennessee.

Item	Solution
_____	_____
_____	_____

Form of business organization

Individual proprietorship _____

Family partnership _____

Other partnership _____

Corporation _____, specify type _____

Other (please indicate) _____

Management Responses to Risk/Variability

This part of the survey lists a number of responses or methods which some farmers use to deal with variability. First, please indicate the relative importance to these methods for dealing with the variability on your farm.

Second, please indicate whether you use this method or response in your farm operation to deal with variability. If you do use a response, please add some brief comments to describe how you use it. Sometimes you may use a response for a reason other than variability. If there are other reasons important to your decision, please indicate this too.

Enterprise diversification: production of more than one enterprise to spread risks and stabilize total returns.

Do you use this method? _____ yes _____ no

How important is this method to you? (Please circle appropriate response.)

Very Important	Important	Not Important	Does not Apply
3	2	1	0

If you use this method, please provide a brief description of what you do.

_____

_____

_____

Spreading sales: Use of frequent sales to stabilize prices and to approach the average price during the marketing period.

Do you use this method? _____ yes _____ no

How important is this method to you? (Please circle appropriate response.)

Very Important	Important	Not Important	Does not Apply
3	2	1	0

If you use this method, please provide a brief description of what you do.

_____

_____

_____

Contract production: use of contractual agreement with a buyer that specifies price, quantity, time and perhaps other stipulations of commodity delivery.

Do you use this method? _____ yes _____ no

How important is this method to you? (Please circle appropriate response.)

Very Important	Important	Not Important	Does not Apply
3	2	1	0

If you use this method, please provide a brief description of what you do.

_____

_____

_____

Market information: obtaining outlook information and reports on market conditions that contribute to knowledge of expected prices.

Do you use this method? _____ yes _____ no

How important is this method to you? (Please circle appropriate response.)

Very Important	Important	Not Important	Does not Apply
3	2	1	0

If you use this method, please provide a brief description of what you do.

_____

_____

Socioeconomic Information

The information in the section, like the previous sections, is strictly confidential. It is important because your attitudes and responses may be related to these characteristics.

Please complete or check the appropriate response.

For the primary farm operator:

Age _____ Race_____

Number of years of formal education _____

Years of farming experience _____

Marital status _____

Number of dependents _____

Number of family members involved with farm's vegetable production or marketing _____

Time spent in off-farm employment (average hours per week during year).

Job	Part-time	Full-time
Primary farm operator _____	_____ hrs.	_____ hrs.
Spouse _____	_____ hrs.	_____ hrs.

APPENDIX C



Figure C-1. The "Pick-Tennessee-Products" logo devleoped by the Marketing Division of the Tennessee Department of Agriculture and used to promote locally grown agricultural products, including produce.

VITA

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