The Horticultural Producers Federation:
A Comprehensive Approach
for Addressing the Problems of
Small-Scale Vegetable Marketing Cooperatives

by
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(ABSTRACT)

A theoretical analysis of marketing cooperatives indicates that in imperfect markets where cooperative members possess the resources to expand production to levels where their marginal costs equal their marginal returns, both producers and consumers are better off than if the producers sell smaller output quantities to investor-oriented firms at a lower market price. Although the United States government has supported the formation and operation of many small-scale marketing cooperatives in the southeast, their success has been low.

This thesis describes one approach used to increase the viability of small-scale vegetable marketing cooperatives through a federated cooperative, the Horticultural Producers Federation (HPF). The HPF provides marketing and management services that address specific market failures and intra-firm inefficiencies encountered by its member cooperatives. HPF services include record keeping, market information, financial planning and management, accounting and payroll, educational and technical support, centralized marketing, and a newsletter. The development and implementation of these services is described in this thesis as is the cooperatives’ evaluation of these services through the five year duration of the study. The cooperatives’ final evaluation of the services and the HPF indicated that on average they were more than satisfied with the individual HPF services and the impact of the HPF on them and their members.
Future challenges for the HPF include the development of more services by the HPF or other agencies to address a few remaining problems. Services which would target areas of concern include centralized computer support; public relations and promotion activities; as well as member, director, and management training. The large majority of cooperative members which are part-time farmers also poses a significant challenge. Until these farmers gain the resources and expertise to intensively manage their operations, the individual cooperatives and the HPF centralized marketing service will face problems of under production and poor quality.
The work contained in this thesis would not have been completed without the financial support provided by both the United States Department of Agriculture (USDA) Agricultural Cooperative Service (ACS) and the USDA Agricultural Marketing Service and without the cooperation of the Tennessee Valley Authority (TVA). Several key people have also played a major role in the completion of this thesis. Thanks goes to my committee made up of Dan Taylor, Jim Bell, and Bill Taylor for helping me fulfill the department's quality standards for a master's thesis. These three professors agreed to be committee members five years ago and have waited patiently while I have worked full-time on grants and only part-time if at all on my thesis. I especially appreciate Dan Taylor's efforts as my chairperson and his help getting my first paper accepted at the American Agricultural Economic Association (AAEA) annual meetings and my first journal article published.

I owe a lot to Jim Bell and sincerely hope that someday I will be able to give somebody a start on a new career like he did for me. Although I had no experience, he saw my potential and has served as my mentor for the last five and one half years. I will by coincidence defend this thesis on the day of Jim's retirement. I hope he will view my completion of this master's degree as a token of my respect.
I also appreciate the help of my parents, Roy and Thelma Kirkpatrick, who set aside their professional editing duties many times to read drafts of papers for AAEA annual meetings, journal articles, and various chapters of this thesis. I not only appreciate my parents for the help they have given me over the years, but I love them dearly for living their faith in God during both good times and bad and for giving me an unshakable standard by which to live my life.

Lastly and most importantly, I wish to express my gratitude and love for my husband, Rich Kazmierczak. Without Rich's help and encouragement I would never have had the perseverance to finish this thesis. My life has become so full in the five and one half years I have known him and especially in the two years since we married. He has helped me add many, many dimensions to my life and I thank him from the bottom of my heart.
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Chapter One: Introduction

Background -- Southeastern Vegetable Marketing Cooperatives

Agricultural production has traditionally been a major source of income in the southeastern United States. In particular, livestock, tobacco, soybeans, peanuts, and grain crop production have supplied most of this income. Vegetable production has also provided many small and part-time farmers with a source of income. The importance of vegetables has increased in recent years because declining prices and reduced governmental support programs for traditional agricultural commodities have left many farmers searching for alternative sources of income. In addition, the health concerns which have recently swept the nation have increased the demand for vegetables and helped increase the attractiveness of this alternative source of income for many farmers and farm communities.

Diversification into vegetable production was attractive to many southeastern farmers because:

- vegetable cultivation requirements were similar to tobacco,
- vegetable production required little additional capital investment for specialized equipment.

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1 The southeast as used here includes the states of Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. This region is defined so as not to include the large vegetable producing area of Florida.
• unskilled hired labor could be substituted for large outlays of capital, and
• small amounts of land could produce relatively large amounts of product.

Despite these advantages, farmers producing vegetables as an alternative to traditional agricultural crops were faced with several problems. First, these individuals could usually produce more volume than local buyers required but not enough volume to satisfy large wholesale buyers. Second, the large wholesale buyers required a regular supply of a consistent quality product. Individual farmers were often unable to meet these requirements because they lacked the resources to spread harvests over extended periods and to provide consistent quality in a product that was mostly field packed. Third, these farmers encountered quality and quantity problems because of their inexperience with vegetable cultivation. Fourth, these farmers were exposed to a much higher degree of price risk than when growing traditional crops because they were not protected by government programs. Increased volume, intense field management, specialized packing equipment, improved cultivation practices, and risk management strategies were required to address these various problems. Many vegetable producers could not achieve solutions to these problems on their own and as a result, farmers in a number of communities established vegetable marketing cooperatives.

**The Problem**

Unfortunately, vegetable marketing cooperatives did not provide a panacea for vegetable farmers and the failure rate of these cooperatives has historically been very high\(^2\). The problems experienced by these cooperatives were of several different types. First, southeastern farmers diversifying into vegetable production had a distinct comparative disadvantage relative to firms based in traditional vegetable production areas such as California and Florida, that often resulted in substandard quality vegetables. Secondly, the cooperatives

\(^2\) Personal experience with HPF members between 1985 and 1987 indicates that southeastern vegetable marketing cooperatives have a twenty percent failure rate per year.
which these farmers formed encountered market level problems related to the volume they could provide and oligopsonistic markets. Lastly, the cooperatives faced internal inefficiency problems relating to members' production schedules, product quality, cooperative record keeping, accounting, payroll, and the lack of a strategic management plan.

**Study Justification**

In 1922 the Capper-Volstead act formally recognized the right of farmers to cooperate economically without violating previous anti-trust legislation and in 1926 the Cooperative Marketing Act provided for the establishment of a division in the Department of Agriculture to promote cooperative principles and practices (Roy). Based upon these policy decisions and the high failure rate of small-scale vegetable marketing cooperatives the current study was initiated: 1) to help increase the viability of these cooperatives, 2) to consolidate and thus reduce total government aid to these groups by funneling it through a federation of cooperatives, and 3) to eventually wean this federation and its member cooperatives off of government support.

**Objectives**

The overall objective of this study was to improve the viability of small-scale vegetable marketing cooperatives by addressing their market level failures and intra-firm inefficiency problems through a federation of cooperatives, specifically the Horticultural Producers Federated Association (HPF). The specific objectives of this study are listed below:

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3 These functions are now performed by the Agricultural Cooperative Service.

4 Small-scale was defined as cooperatives with fewer than 500 active members and gross annual sales of less than $1 million.
1. to promote the flow of ideas between HPF cooperatives,
2. to develop a comprehensive package of management and marketing services for HPF cooperatives,
3. to measure the cooperatives’ satisfaction with the resulting package of services,
4. to measure the cooperatives’ perceptions of the HPF’s impact on their organization, and
5. to help the HPF become a self sustaining organization balancing the needs of all its membership.

**The Horticultural Producers Federated Association**

The HPF was organized as a federation of cooperatives in October of 1983 by five vegetable marketing cooperatives in the states of Kentucky, North Carolina, Tennessee, and Virginia. The purpose of the HPF was “to provide services to member cooperatives that will help them solve common problems and improve marketing operations” (Horticultural Producers Federated Association, 1984, p.1). Since the HPF group was small and had limited resources, they asked state and federal agencies to help their fledgling group identify problems, develop services to address these problems, and evaluate the effectiveness of the resulting services and the HPF. Virginia Polytechnic Institute and State University (VPI & SU) took the lead in this endeavor after receiving support in the form of several cooperative agreements from the United States Department of Agriculture (USDA) Agricultural Cooperative Service (ACS) and the USDA Agricultural Marketing Service (AMS).

**1983 Survey of Cooperatives**

This thesis builds upon work funded by the ACS and conducted at the VPI & SU from 1983-1984. In this work Lively and Bell conducted personal interviews with representatives of thirty small-scale fruit and vegetable marketing cooperatives to obtain profiles of their op-
erations, business activities, financial situations, and interest in proposed HPF services. These thirty cooperatives were selected from a comprehensive list of southeastern fruit and vegetable marketing cooperatives compiled from material provided by the ACS, state councils of farmer cooperatives, state departments of agriculture, and the state cooperative extension services in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Texas, and Virginia. Although many of the cooperatives on the list were no longer in business, the thirty cooperatives selected for the interviews were identified as operating concerns which were also interested in participating in the study. Nine of these cooperatives were located in North Carolina, five in Virginia, four in Arkansas, three in Tennessee, three in South Carolina, two in Kentucky, two in Alabama, and two in Georgia. Of the thirty cooperatives surveyed, twenty-three marketed vegetables and seven marketed fruit (apples). For a description of the 1983 survey instrument and a complete profile of all thirty cooperatives surveyed see Lively and Bell.

Ten of the thirty cooperatives surveyed were targeted by Lively and Bell as either current or potential members of the HPF based on various criteria of the cooperative, which are discussed in more detail in Chapter 3. These targeted cooperatives all marketed vegetables and had been in operation for an average of 10 years (Table 1). This suggests that many of these cooperatives were formed in the mid-1960’s and early 1970’s when start-up capital from governmental agencies, such as the Office of Economic Opportunity, and other Federal programs was available. The average 1983 membership of these ten cooperatives was 122 producers. Most cooperative members were part-time farmers, had small land holdings, and derived 33 percent of their family income from the vegetables marketed through the cooperative (Table 1).

Operating policies of the marketing cooperatives varied among the individual firms. Eighty percent of the cooperatives paid their growers a pool price, the other 20 percent paid their members the daily market price, and 60 percent of the cooperatives used a broker to market all or part of their produce (Kirkpatrick and Bell, Lively and Bell). There were similarities in
### Table 1. Characteristics of Ten Targeted Southern Vegetable Marketing Cooperatives.

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<tr>
<td>Average years in operation</td>
<td>10 years</td>
</tr>
<tr>
<td>Average 1983 membership</td>
<td>122 members</td>
</tr>
<tr>
<td>Average 1978-1983 membership</td>
<td>130 members</td>
</tr>
<tr>
<td>Average farm size</td>
<td>68 acres</td>
</tr>
<tr>
<td>Percentage of family income from vegetables *</td>
<td>33 percent</td>
</tr>
<tr>
<td>Percentage of members farming full-time</td>
<td>19 percent</td>
</tr>
<tr>
<td>Percentage of members farming part-time</td>
<td>81 percent</td>
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*Vegetables marketed through the cooperative.

Source: Kirkpatrick and Bell, p. 8.
the commodities handled by the targeted cooperatives; tomatoes and green peppers were grown more often than any other vegetable crop (Table 2).

**General Approach**

This thesis began by focusing on the cooperatives targeted by Lively and Bell in 1983 and their interest in nine proposed services which are discussed in more detail in Chapter 3. Over the next five years, a full compliment of services was developed through this study for the HPF and its membership. Although several cooperatives dropped out of the study, other cooperatives joined and by the end of 1988 the HPF members included thirteen cooperatives in nine states: Alabama, Arkansas, Kentucky, Illinois, Mississippi, North Carolina, Oklahoma, Tennessee, and Virginia. The cooperatives’ evaluations of the services were monitored throughout the study by personal feedback and questionnaires. The information obtained through these channels was constantly evaluated and used to improve existing services and develop new offerings. The VEGMARC II Record Keeping Program was the most closely monitored of all the services developed because it was custom programmed for the members of the HPF. The process of developing, implementing, and evaluating the package of HPF services and in particular the VEGMARC II Record Keeping Program will be examined in more detail later in this thesis.

**Overview of the Thesis**

Chapter two of this thesis examines the theoretical justification of cooperatives, decision making in cooperatives, cooperative failures, and federated cooperatives as one means of reducing cooperative failures. Chapter three details the development and implementation of HPF services. Chapter four reports the cooperatives’ evaluation of the HPF services and the HPF’s impact on the cooperatives as well as a discussion of the services and the impact of the HPF. Finally, chapter five summarizes the results of the study, draws conclusions about the effectiveness of the study, and suggests areas for future research.
Table 2. Commodities Handled by Targeted Southern Vegetable Marketing Cooperatives.

<table>
<thead>
<tr>
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<th>Number of Cooperatives Handling Crop</th>
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<tr>
<td>Tomatoes</td>
<td>8</td>
</tr>
<tr>
<td>Green peppers</td>
<td>5</td>
</tr>
<tr>
<td>Cabbage</td>
<td>2</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>2</td>
</tr>
<tr>
<td>Broccoli</td>
<td>1</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>1</td>
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Source: Kirkpatrick and Bell, p. 9.
Chapter Two: Properties of Cooperatives and Their Potential for Failure

Prior to outlining the specific approaches of this study, a brief examination of the properties of cooperatives and cooperative theory is necessary to better understand the function of agricultural cooperatives, their niche in the market place, and why they are encouraged and supported by the United States government. An inspection of the problems faced by small-scale cooperatives and some possible reasons for their failures will also be discussed. Subsequently, the concepts behind federated cooperatives as one way of addressing cooperative failures will be examined.

Defining Properties of Cooperatives

The cooperative form of business is a subset of one of three legally recognized business structures (Barton). These forms include:

- Proprietorship
- Partnership
- Corporation
  - Investor-Oriented Corporation
  - Cooperative
The cooperative form of business can be distinguished from all other business forms on the basis of three criteria: ownership, control, and benefits. Both the proprietorship and partnership forms of business are owned, controlled, and provide benefits solely to the proprietor or partners. The investor-oriented corporation is owned by multiple investors buying stocks in the firm, ultimately controlled by these investors, and provides profit based benefits to the investors on the basis of the magnitude of their investment. A cooperative, however, is the only business type that is owned and controlled by those who use the business and which distributes its net profits to patrons based on their level of usage. Therefore for the purposes of this thesis, all business forms will be divided into two categories, investor-oriented firms (IOF) and user oriented firms. Proprietorships, partnerships, and investor-oriented corporations are all included in the IOF classification, while cooperatives are contrasted as user oriented firms.

Using the criteria of ownership, control, and benefits, Dunn (p. 85) formally defines a cooperative as a "user-owned and controlled business from which benefits are derived and distributed on the basis of use." This treatment of the so called principles of cooperation falls under Barton’s Contemporary classification. Other classifications of cooperative principles in the current literature include the Rochdale principles, the Traditional principles, and the Proportional principles (Barton). The merits of these various approaches are not of consequence to the work being examined in this thesis. It is sufficient for this document that the reader have a clear understanding of those characteristics which distinguish a cooperative from other forms of business.

**Economic Justification of Cooperatives**

Farmer cooperatives represent the apparent vertical integration of farm production enterprises upstream into purchasing enterprises or, as is the focus of this thesis, downstream into

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5 Vertical integration is the operation of a single firm at more than one level in the production process.
marketing enterprises (Shaffer). In the perfect market described by the Neoclassical Theory of Markets there would be no rational reason for farmers or other businesses to vertically integrate their production processes. In this market all consumers and producers would face a single commodity price for all market transactions involving a specific commodity (Russell and Wilkinson). Consequently no form of business operation, cooperative or otherwise, would be favored by the market (Schrader).

The assumptions which underlie this theoretical perfect market are listed below:

- the market contains a large number of buyers and sellers, so that all market participants act as if they are price takers;
- the market contains firms which produce identical products with no product differentiation;
- the market allows the free exchange of commodities without transaction costs in addition to the free entry and exit of consumers and producers; and
- all market participants possess perfect knowledge about the price, physical characteristics, and availability of each commodity (Russell and Wilkinson).

The Market Failure Justification

The absence of perfect market conditions in the economy is one of two ideological justifications for joint action by farmers through marketing cooperatives. This market failure approach to cooperative formation can be further subdivided into two components: competitive yardstick and market power.

Competitive Yardstick Approach

The competitive yardstick school of thought encompasses failures of all four assumptions of a perfectly competitive market. This approach views cooperatives as a mechanism providing

Cooperatives give only the illusion of vertical integration between farmer/members because the members' production decision remains independent of the cooperative and its goals.
a system of competitive and efficient farm inputs and marketing services, against which the performance of other firms can be compared. Schrader (p. 132) explains that cooperatives successfully filling this role "will find that the going price charged by all businesses is equivalent to pricing at cost when all costs, including a return to capital invested, are considered."

**Price Taker Assumption Failure:** The price taker assumption of neoclassical theory fails in several ways in our present agricultural economy. In general farmers do behave as price takers on both the supply and production sides of their businesses. However, those market participants with which farmers do business often have the ability to price above the minimum of the average cost curve for a variety of reasons. These reasons include the realization of economies of size and spatial considerations present when the demand for product is too small to support more than one firm in an area and farmers are unwilling to travel to the next source of supply. By organizing a marketing cooperative, farmers are able to capture some of these economic benefits for their own businesses. Economies of size can be realized and competition is provided to spatial monopolists and monopsonists to the benefit of both the farmer and the consumer.

**Identical Product Assumption Failure:** The neoclassical assumption that farmers produce identical products also fails to hold in today’s agricultural sector. Although a symptom of imperfect knowledge, product grading and inspection requirements are a direct result of quality differentials between producers. While the cost of grading equipment and a federal/state inspector may be burdensome for individual farmers, the formation of a cooper-

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6 Average cost is the total cost of production divided by the quantity of output produced.

7 Economies of size are achieved by increasing the volume of output in order to spread the firm’s fixed cost over a large volume of outputs. At some volume, however, increased management and other variable costs will outweigh the decreased average costs and diseconomies of size occur.

8 A monopolist is the only seller of a good in a market.

9 A monopsonist is the only buyer of a good in a market.
ative can help spread these costs across many growers. By providing grading services and federal/state inspectors for members’ products, a cooperative can combine product of like quality and certify that quality. These services will significantly reduce the incidence of price penalties and product rejection by purchasers of the product.

**Free Market Assumption Failure:** Violations of the neoclassical free market assumption occur frequently in today’s agricultural markets. For example, farmers marketing perishable products and/or owning production facilities which cannot be used for other purposes may be in inferior bargaining positions. Buyers in these situations have been known to offer producers low prices and/or threaten not to buy future loads. Farmers are often forced to accept these terms because of their products’ perishability and the necessity of recovering the products’ variable\(^{10}\) if not fixed\(^{11}\) costs. In this situation a cooperative would help provide a guaranteed market for perishable and capital intensive crops at a reasonable price. In addition, this type of problem might be alleviated as the cooperative’s larger market share helps it gain more market power.

The existence of transaction costs\(^{12}\) is another example of the failure of the free market assumption. By spreading the fixed portion of these costs across many growers, a cooperative can realize economies of size for cooperative members which they would be unable to capture when operating individually.

**Perfect Knowledge Assumption Failure:** Even in today’s information permeated society the neoclassical assumption that all market participants have perfect knowledge of each product’s price, physical characteristics, and availability is absurd. In reality the gathering of pertinent

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\(^{10}\) The variable costs of production are those costs which vary directly with changes in the volume of production.

\(^{11}\) The fixed costs of production are those costs which remain constant regardless of a firm’s volume of production in the short run.

\(^{12}\) Transaction costs are those costs incurred when a good or service is bought and sold in the market place. These include the costs of obtaining information on the price and quality of the product, as well as the costs incurred in enforcing market contracts.
information for a farmer carries a cost even when government agencies gather the information for farmers as is the case with the federal/state market news. A cooperative can accept these monetary and time costs, thereby reducing the cost for each member farmer.

The idea of perfect knowledge would also eliminate all market related risks for producers, who knowing the price of all products on any given day would plan their production schedules accordingly. This is not the case, so cooperatives which pool prices\(^{19}\) can help growers reduce their price risks over the pool period. This is especially true of commodities such as vegetables which can experience volatile price swings in the course of a few days.

**Market Power Approach**

Market power is the second component of the market failure justification for cooperatives and results from the failure of the price taker and free entry assumptions of a perfectly competitive market. In instances when farmers are receiving less than free market price for their product or paying more than free market price for their supplies, cooperative efforts to gain market power may be appropriate. However, unlike the competitive yardstick situation, when cooperative organization benefits both farmers and consumers, cooperative efforts to increase market power on the output side of their business could drive the market price above the free market price and decrease consumer welfare. The Capper-Volstead Act strives to protect consumers by prohibiting undue price enhancement by marketing cooperatives.

**Price Taker Assumption Failure:** As mentioned earlier in the competitive yardstick section, the suppliers of farm inputs and purchasers of farm outputs often do not act as price takers. These individuals often use their market power to raise the market price of supplies and decrease the market price of outputs relative to that expected in a free market system. Many proponents of cooperative organizations feel that this situation justifies cooperatives in their

\(^{19}\) A pool price is a weighted average of prices received by the cooperative for a specific commodity during a specified time called a pool period.
efforts to obtain market power for themselves through the supply management and government exemption techniques mentioned in the next section.

**Free Entry Assumption Failure:** As a direct result of the failure of the neoclassical price taker assumption, cooperatives are often used as a sanctioned means to gain market power for farmers. Specifically, cooperatives can increase the returns to the farmer by taking advantage of government approved market imperfections in the form of subsidies, tax and regulatory exemptions, and marketing orders. All of these income enhancement techniques violate the neoclassical image of the perfect market.

**The Social Justification**

The second justification of cooperatives places at least as much emphasis on the social development of communities and individuals through cooperatives as on the economic benefits resulting from the formation of a cooperative business. Christy describes such rural communities as suffering tremendous effects when bypassed by economic growth and changes in technology. The farmers in these areas are left poor and powerless. Most of the cooperatives participating in this study were organized in rural areas like those described by Christy and differ from many other cooperatives in three ways.

1. Their members are low-income limited resource farmers,
2. their members' labor, not capital, is the major contribution made to the support of the cooperative, and
3. the management and leadership qualities required to effectively operate the cooperative are often lacking in these poor rural areas.

**Decision Making in Marketing Cooperatives**

The decision making goals of marketing cooperatives are less clear than those of their IOF counterparts. As a user owned business, marketing cooperatives face several situations not
encountered by IOFs. First, cooperatives find it more difficult to generate capital because the value of a cooperative’s capital expenditures for future production periods cannot be capitalized in the same way that an IOF stockholder would capitalize the same expenditures through the sale of stocks. In cooperative literature this is known as the horizon problem. Secondly, the actions of the IOF shareholders generally do not affect the output level of the IOF and thus do not affect the firm’s ability to meet its output goals. Cooperative patrons however, are both the owners and users of the business and often affect the output level of the cooperative. It is this fact which is responsible for what Shaffer calls the cooperative’s illusion of vertical integration. Since the patrons’ decisions are independent of the cooperative, the patron will make his/her production decision based on the payments received from the cooperative. The fact that this payment contains two component parts, the producer price for the product and the amount of the patronage refund, and that the patron often views the total payment as the market price directly impacts on the patron’s production decisions. The amount of patronage refund paid to each member by the cooperative is equal to his/her percentage of total patronage times the cooperatives’ net income. Therefore, the patronage refund is roughly equivalent to the dividend payments received by IOF shareholders based upon their investment in the firm. The consequences of the patron owner viewing the sum of the producer price and patronage refund payments as the market price when making his/her production decisions and this views affect on the rational decision goals for the cooperative will be discussed in detail later in this chapter.

**IOF Decision Making Under Perfect Competition**

Neoclassical theory of the firm assumes that IOFs maximize net income/profits under conditions of both perfect and imperfect competition by equating their firm’s marginal input cost

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14 Market price as used in this thesis equals the producer price plus the amount of the patronage refund.

15 This theoretical analysis of the impact of the patronage refund on a patron’s production decision does not take into account the fact that the patron only receives twenty percent of the payment in cash and the rest as a certificate for future redemption. Therefore the total patronage refund is roughly equivalent to the IOF dividend payments and patron production decisions are still affected in the same manner, although they are not affected to as great a degree.
with their value of marginal product\(^\text{17}\), MIC = VMP, in their input markets and equating their firm’s marginal cost\(^\text{18}\) with their marginal revenue\(^\text{19}\), MC = MR, in their output markets (Figure 1) (Gould & Lazear). Panel 1 of Figure 1 graphically illustrates a perfectly competitive input market where the marginal input costs of a firm equals input price, MIC = P, and the value of marginal product (VMP) represents the demand curve for inputs faced by the firm. Panel 2 of Figure 1 depicts a perfectly competitive output market where marginal revenue equals price, MR = P, and therefore market demand\(^\text{20}\) (D), and the marginal cost curve (MC) represents the output supply curve of the firm. Quantity \(Q_1\) would be employed and \(Q_2\) would be produced by profit maximizing firms in Panel 1 and Panel 2 of Figure 1 respectively.

Also depicted in Panels 1 and 2 on Figure 1 is a brief welfare analysis of the consumer and producer surplus respectively, existing under perfect competition. Consumer surplus is the amount of money retained by the consumer, in this case the purchaser of production inputs, which they would be willing to spend to purchase that product. Graphically this concept is depicted as the area below the input demand curve, VMP, and above the market price, \(P_1\), as depicted in Panel 1 on Figure 1. The producer surplus of a firm is the producer’s profit. Graphically this profit is depicted as the area above the producer’s marginal cost curve, MC, and below the market price received (Panel 2 on Figure 1). The magnitude of the sum of producer and consumer surplus is often used as a relative measure of society’s welfare.

\(^{16}\) Marginal input cost equals the addition to total input costs attributed to the addition of one unit of input, \(MIC = \frac{\Delta TC}{\Delta Q_{\text{input}}}\).

\(^{17}\) Value marginal product equals the marginal product, the addition to total product attributable to the addition of one unit of input, times the market price of the commodity in question, \(VMP = (MP)P\).

\(^{18}\) Marginal cost is the addition to total cost attributed to the addition of one unit of output, \(MC = \frac{\Delta TC}{\Delta Q_{\text{output}}}\).

\(^{19}\) Marginal revenue is the addition to total revenue attributed to the addition of one unit of output, \(MR = \frac{\Delta TR}{\Delta Q_{\text{output}}}\).

\(^{20}\) Market demand equals the total quantity of a product demanded by all consumers at each price.
Panel 1. Input Market

Panel 2. Output Market

Figure 1. IOF Pricing Objectives under Perfect Competition
IOF Decision Making Under Imperfect Competition

Panels 1 and 2 on Figure 2 represent the input and output markets of firms operating under imperfect competition. The input market in Panel 1 of Figure 2 illustrates a monopsonistic firm which can influence its per unit costs by selecting the number of inputs it purchases as shown by the upward sloping marginal input cost curve (MIC). A profit maximizing firm in this situation will buy $Q_1$ inputs by equating its marginal input cost with its value marginal product, $MIC = VMP$. Although this firm would be willing to pay $P_1$ for $Q_1$ inputs, the sellers of the inputs are willing to sell for $P_2$ since at that price they will be covering their marginal costs\(^{21}\). As a result, the monopsonist will keep $P_1 - P_2$ as monopsonistic rent, excess profits above those accrued if price were equated to marginal input costs.

Panel 2 of Figure 2 depicts a monopolistic firm facing a downward sloping marginal revenue curve (MR). This firm can influence its per unit revenue by changing the level of its output. To achieve profit maximization the monopolist will equate its marginal revenue with its marginal cost curve, $MR = MC$. The marginal cost curve (MC) is also the market supply curve (S) since the monopolist is the only seller in the market. As a result, the monopolist would be willing to sell $Q_2$ for $P_4$ because marginal costs are covered at that point. The firm will, however, sell the product for $P_3$ and collect $P_3 - P_4$ as monopolistic rents because the market demand for the product is larger than the firm’s marginal revenue, $D > MR$. The monopolistic rents are excess profits above those accrued when price equals marginal revenue, $P = MR$.

The changes in welfare between the perfect and imperfect competition cases will be analyzed more fully using Panels 1 and 2 on Figure 3. These graphs are the same as those displayed in Figure 2 with the perfect competition equilibrium price, $P_0$, and equilibrium quantity, $Q_0$, now included are six labeled areas to aid the following discussion of welfare changes. The monopolistic rent shown in Panel 1 of Figure 2 is equivalent to area $B + E$ in Panel 1 of Fig-

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\(^{21}\) The market supply curve equals the summation of the input sellers marginal cost curves, above their average cost curves in the long run, and above their average fixed cost curves in the short run.
Panel 1. Input Market

Panel 2. Output Market

**Figure 2.** IOF Pricing Objectives Under Imperfect Competition

Chapter Two 20
Figure 3 and the monopolistic rent depicted in Panel 2 of Figure 2 is the same as area B+E in Panel 2 of Figure 3.

Given the perfect competition equilibrium price and quantity, the consumer surplus in the input market is depicted by the area A+B+C and is captured by the firm purchasing the inputs (Panel 1 of Figure 3). The producer surplus is shown by the area D+E+F and is retained by the producer selling inputs to the firm (Panel 1 of Figure 3). In the imperfect input market depicted in Panel 1 of Figure 3 by the upward sloping marginal input cost curve, MIC, the consumer surplus is the area A+B+E and the producer surplus is the area F. The firm buying the input kept the surplus represented by areas A and B, gained the surplus in area E, and lost the surplus in area C. The producer selling the input to the firm kept the surplus in area F and lost the surplus in areas E and D. Therefore, the net effect of an imperfect input market versus a perfect input market is that the firm buying the input realizes a net gain of E-C consumer surplus, the producer selling the input suffers a producer surplus loss of areas E and D, and the surplus represented by areas C and D is completely lost to society. On the whole therefore, society is worse off when imperfect input markets exist.

Panel 2 of Figure 3 depicts an imperfectly competitive output market. Given the perfect market equilibrium price and quantity the consumer surplus is illustrated by the area A+B+C and is captured by the consumer buying the manufactured product from the firm. The producer surplus is depicted by the area E+D+F and is retained by the firm manufacturing the product being sold. Panel 2 of Figure 3 with its downward sloping marginal revenue curve, MR, depicts an imperfectly competitive output market. In this imperfect market the consumer surplus captured by the consumers of the manufactured product is shown by area A and the producer surplus retained by the firm manufacturing the product is illustrated by areas B+E+F. Therefore, the existence of an imperfect output market left consumer surplus area A unchanged, and eliminated areas B and C. Producer surplus in this market maintained areas E and F, added area B, and lost area D. Notice that areas C and D were completely lost to all market participants. The net effect of the imperfect output market was a loss of surplus

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Figure 3. A Crude Welfare Analysis of Consumer Surplus, Producer Surplus, Monopsonistic Rents, and Monopolistic Rents.
represented by the areas C and D, illustrating that society is worse off with a monopoly than with a perfectly competitive output market.

**Cooperative Decision Making**

Since cooperatives often organize in response to market imperfections, it can be assumed that marketing cooperatives are operating under some conditions of imperfect competition. In order to illustrate this situation in this thesis utilizing neoclassical economic theory cooperatives are assumed to be behaving as spatial monopsonies in their input market and spatial monopolies in their output market. In simpler terms the cooperative is assumed to be the only buyer of product from the farmers in the area and the only seller of processed product in the area. However in order to focus on the returns to the cooperatives grower’s, this analysis is net of the cooperative’s fixed costs and the payments made to growers (Helmberger and Hoos). Implications of these assumptions are shown in Figure 4 where the input and output markets of a cooperative are shown on the same graph. The cooperative is shown as facing a downward sloping marginal net revenue curve\(^{22}\) (MNR) and an upward sloping marginal input cost curve (MIC). The downward sloping market demand curve (D) and the upward sloping market supply curve (S) are also shown in Figure 4. In addition, this analysis assumes the marketing cooperatives have the same cost relationships as IOFs, are incurring no loss of inputs, and are distributing patronage refunds equal to the cooperative’s total net income. In this framework the each of the following five short run maximization goals for a marketing cooperative can be readily analyzed (Schmiesing).

1. Maximize net price received by patrons (marginal net revenue equals average net revenue\(^{23}\), \(\text{MNR} = \text{ANR}\)).

\(^{22}\) Marginal net revenue equals the addition to net revenue, total revenue minus the cooperative’s processing and marketing costs, attributed to the addition of one unit of output. Therefore, \(\text{MNR} = \Delta(\text{TR} - M)/\Delta Q_{\text{output}}\) where \(M\) equals the processing and marketing costs of the cooperative.

\(^{23}\) Average net revenue equals the cooperative’s total revenue minus its fixed and variable costs not including the cost of grower payments, divided by the output quantity. That is \((\text{TR} - \text{TC})/Q_{\text{output}}\) where TC does not include grower payments.
2. Maximize net income like an IOF (marginal net revenue equals marginal input cost, MNR = MIC).

3. Operate at cost or break even (average net revenue equals market supply, ANR = S).

4. Maximize dollars of sales for the cooperative (marginal net revenue equals zero, MNR = 0).

5. Maximize patronage refund payments (marginal net revenue equals market supply, MNR = S).

**Maximize Net Price Received by Patrons**

Cooperatives choosing to maximize the net price per unit received by their members equate their marginal net revenue with their average net revenue, MNR = ANR, as shown by point 1 in Figure 4 (Schmiesing). Therefore the price \( P_1 \) is the producer price received by the cooperative member. However, the cooperative member also receives \( N_1 - P_1 \) as a patronage refund payment from the cooperative. When viewed as a single payment for product sold through the cooperative the result is an unstable production goal. The member producers realize their marginal revenue greatly exceeds their marginal costs, \( (P = MR) > MC \). Therefore the cooperative members perceive that they can increase profits by expanding their production in future production periods.

**Maximize Net Income**

An unstable production target is also achieved when cooperatives set out to maximize net income like an IOF (Schmiesing). In this strategy the cooperative would equate its marginal net revenue with its marginal input costs, MNR = MIC, as shown by point 2 in Figure 4 in order to maximize the good of the group. At this point however, the member producers will receive the producer price \( P_2 \) for their product and a patronage refund payment of \( N_2 - P_2 \) as their portion of the cooperatives’ profits. Again when viewed as a single payment of \( N_2 \) the producers perceive marginal revenues greater than their marginal costs, \( (P = MR) > MC \). Again the
Figure 4. Five Possible Pricing Objectives for a Marketing Cooperative in the Short Run: Adapted from Schmiesing.
members would individually strive to expand production in the subsequent production period in order to increase their profits.

**Operate at Cost**

A third possible pricing strategy for a marketing cooperative is at point 3 on Figure 4 where the cooperative's average net revenue equals the cooperative supply function, $ANR = S$. At this level of output the cost of the cooperative's average input is exactly equal to the revenue of the cooperative's average output, $AIC = ANR$, and the cooperative is operating at cost. Since the price received by the cooperative equals the producer price, $P_3$, paid to the members there is no incentive for producers to change output levels in future production periods. Using this objective the quantity produced, $Q_3$, is larger than the IOF profit maximizing production level of $Q_2$. The higher production level results in benefits both to the producer who sells more product at a higher price than if he sold to an IOF and to the consumer who faces a lower market clearing price (Figure 5, Figure 6). Figure 5 depicts this cooperative goal as that point at which both the producer and consumer surplus is maximized as a result of the cooperative's business activities beyond that achievable through an IOF. Figure 6 depicts an imperfectly competitive IOF and its profit maximizing production level. The levels of consumer and producer surplus are greatly reduced in Figure 6 relative to Figure 3 because the IOF receives $P_4 - P_3$ in monopsonistic and monopolistic rents.

**Maximize Dollars of Sales**

A cooperative attempting to maximize total dollars of sales will also face an unstable production goal. The cooperative would equate marginal net revenue of the cooperative to zero, $MNR = 0$. At this level of production the producers would receive the producer price of $P_4$ and a patronage refund payment of $N_4 - P_4$ in Figure 4. If viewed as a single payment the producer would again perceive that his/her marginal revenues were greater than his/her marginal costs, $(P = MR) > MC$. Profit maximizing cooperative members would again increase production in future production periods in order to increase profits.
Figure 5. Producer Cost, Producer Surplus, and Consumer Surplus for a Cooperative Operating at Break-Even.
Figure 6. Producer Cost, Producer Surplus, Consumer Surplus, Monopolistic Rents, and Monopsonistic Rents for a Profit Maximizing IOF.
Maximize Patronage Refund Payments

Lastly, the cooperative might wish to maximize the patronage refund paid to its producers. In this instance the cooperative would equate its marginal net revenue with the market supply curve, \( MNR = S \). The producers would be paid \( P_5 \) as the producer price and \( N_5 - P_5 \) as a patronage refund payment. Since \( N_5 \) is much greater than the producers' \( P_5 \) marginal costs, the producers would once again desire to increase profits by increasing production in future production periods.

Demand Effects on a Cooperative’s Production Goals

The difference between the cooperative’s five possible maximization goals becomes less and less significant as the demand for the processed product becomes more elastic\(^\text{24} \) because all five goals result in the same market price (Figure 7). The demand which equals the average net revenue of the cooperative would be a infinitely elastic, represented by horizontal line and in this special case would exactly equal the cooperative’s marginal net revenue. In this situation the cooperative could:

- maximize the net price received by its patrons (marginal net revenue equals average net revenue, \( MNR = ANR \)) at any level of \( Q \),
- maximize its net income like an IOF (marginal net revenue equals marginal input cost, \( MNR = MIC \)) at \( Q_1 \),
- operate at cost or break even (average net revenue equals supply, \( ANR = S \)) at \( Q_2 \), or
- maximize the patronage refund payments to its members (marginal net revenue equals supply, \( MNR = S \)) at \( Q_2 \).

However at all levels of \( Q \), the price, \( P \) remains unchanged.

\(^{24} \) The elasticity of demand is the percent change in quantity demanded induced by a one percent change in price.
Figure 7. Perfectly Elastic Demand Results in One Market Price for Marketing Cooperatives.
Conversely, the difference between the five goals becomes more significant the more inelastic the demand for the processed product. Small changes in quantities produced and subsequently marketed for cooperative members can cause major changes in the net price, producer price plus patronage refund, received for the processed product. As a result, cooperatives operating in such markets should strive to strictly enforce production quotas among members.

**Pluralism Within Cooperatives**

The previous analysis of cooperative decision making rests on the assumption that each cooperative had a "peak coordinator" to decide upon its single maximization objective (Staatz). Much of the recent theoretical work done on agricultural cooperatives recognizes the weakness of this approach and strives to offer new approaches to the complex area of cooperative decision making. Two approaches which introduce pluralistic elements into cooperative decision making are 1) viewing the cooperative as a nexus of contracts and 2) viewing the cooperative as a coalition.

The cooperative as a nexus of contracts assumes that each cooperative participant seeks to maximize his/her own welfare. Therefore those participants with residual claims on the cooperatives net income must monitor the other participants to ensure that the claimants welfare is maximized. The monitoring mechanisms and costs of these mechanisms play a major role in this theoretical approach. The authority to make decisions is divided into decision control and decision management. The decision control aspect of the organization, in this case the cooperative, involves the policy setting and monitoring which rests with the residual claimants and their elected representatives, the board of directors. The decision management aspect of the cooperative involves the implementation of cooperative policy and rests with the claimants hired representative, the manager.

Viewing the cooperative as a coalition is an alternative way to approach the pluralistic elements that are so obvious within both large and small cooperatives. Different types of farm-
ers, managers, other employees, and board members each seek to maximize their own utility. The bargaining process between cooperative participants trying to achieve as many of their individual objectives as possible is an essential part of this approach. The equilibria resulting from the bargaining process and the effect of common cooperative practices on the production stability of the resulting equilibria are the focus of coalitional analyses.

**Cooperative Failures**

As mentioned in the introduction to this thesis, small-scale vegetable marketing cooperatives have experienced a relatively high failure rate. An examination of economic theory points to three reasons why these cooperatives might be disposed to failure. These reasons include 1) comparative disadvantage, 2) market level failures, and 3) intra-firm inefficiencies. These three areas will be examined in the following sections.

**Comparative Disadvantage**

Comparative advantage can be viewed as that combination of natural endowments, production input combinations, location and transportation costs, institutional settings, and amenity factors that give an organization an advantage over similar organizations not possessing one or more of these factors. An organization can have an absolute advantage in one or more of the above factors and still be at a net comparative disadvantage to another organization whose total package of factors is more favorable. Therefore, it can be said that a firm should produce those products which give it the greatest ratio of comparative advantage or the least ratio of comparative disadvantage when compared with other firms (Barlowe).

For example, southeastern vegetable marketing cooperatives incur lower costs transporting product to market and have a potentially fresher product, but they are high cost producers compared to major vegetable producing areas such as California. California’s lower production costs, dependable climate, greater production knowledge, and consistent quality give it an absolute comparative advantage over southeastern vegetable marketing cooperatives.
This absolute comparative advantage of other firms based in other areas over southeastern vegetable marketing cooperatives will be described in this thesis as a comparative disadvantage of these cooperatives to firms based in other areas.

**Market Level Failures**

The market failures examined in earlier sections of this thesis as justifications for the formation of cooperatives can also contribute to the failures of cooperatives. If a cooperative is unable to adequately correct for market imperfections in the price taker and free market assumptions it will be especially prone to failure. More specifically, a cooperative unable to generate sufficient product volumes to achieve economies of size comparable with its competitors and influence its oligopsonistic output markets has not fully carried out the mandate from its members.

Southeastern vegetable marketing cooperatives experience major difficulties producing large volumes of quality products, obtaining current market information, and obtaining educational and technical support. Many of these problems arise as a result of the small resource base from which many of these cooperatives operate. This resource base is provided by the cooperatives’ membership of which over eighty percent are part-time farmers having limited resources to allocate to vegetable production. Although the rest of this resource base is provided by full-time farmers, some of these operations are unwilling to commit large amounts of time and capital to the vegetable marketing cooperative since they grow vegetables “part-time” in order to add diversity to their more traditional full-time farming operations.

**Intra-Firm Inefficiencies**

Economic efficiency is a somewhat intuitive concept where the maximum output is achieved from the optimum combination of resources as determined by the existing price structure (Yotopoulos and Nugent). In this framework firms would have identical input/output ratios, and thus identical levels of efficiency, when:
they face the same production function,
they face the same input and output prices, and
they maximize profits perfectly and instantaneously.

In its most elemental form neoclassical theory assumes these three situations are true and thus assumes away the problem of differing input/output ratios between firms. Inefficiencies within the firm are thus a difficult phenomena to explain when one tries to fit the concept into the traditional framework of neoclassical economics.

By relaxing some of the assumptions of standard economic theory it is possible to allow for varying production functions between firms and imperfect pricing signals in input and output markets. An analysis of economic efficiency is often preformed within this framework by analyzing its two component parts: allocative efficiency and technical efficiency. Allocative efficiency attempts to measure the effectiveness of the response to market prices of inputs and outputs among firms. Technical efficiency attempts to measure the success of a firm in producing the maximum quantity of output for a given combination of inputs or its ability to operate on its production frontier (Yotopoulos and Nugent). Although allocative efficiency only indirectly affects a firm's internal efficiency, technical efficiency directly affects this internal efficiency.

Technical efficiency recognizes the fact that intra-firm inefficiencies do occur, although it only explains inefficiencies arising out of a limited set of circumstances. For example, inefficiencies arising out of imperfect knowledge such as incomplete knowledge of weather patterns and production practices can be explained once the basic assumption of a firm possessing perfect knowledge is relaxed. However, observed underutilization of resources arising from variations in management/worker motivation cannot be adequately explained by a neoclassical firm level profit maximizing/cost minimization approach.
This profit maximizing/cost minimizing neoclassical theory works best in the perfectly competitive markets for which it was designed or close approximations of those markets. However in real world imperfect markets where businesspersons seek and find shelters from competition, an explanation is needed for the common occurrence of underutilization of production resources. Leibenstein (1966) suggested the concept of X-efficiency to address these situations while also encompassing the traditional concept of technical efficiency. This broader approach to intra-firm inefficiencies is more appropriate to the work on small-scale marketing cooperatives set forth in this thesis.

The two major departures of X-efficiency theory from neoclassical theory are: 1) that the individual and not the firm is the basic decision making unit and 2) that a given set of inputs cannot be transformed into a given level of outputs (Leibenstein 1979). The implications of these departures are that the neoclassical profit maximization goals of a firm’s residual claimants almost certainly will not be the goals of the firm’s agents, managers, and workers, especially if that firm has a relatively large number of employees, for example more than ten (Leibenstein 1979). This is of particular importance in marketing cooperatives where four main groups of agents affect the output of the organization: members/owners, board members, managers, and other employees. The individual effort decisions of participants within each of these groups strongly affects the level output for the cooperative.

Leibenstein describes several underlying assumptions for his X-efficiency theory. These include:

- Contracts for labor are incomplete.
- Not all factors of production are marketed, and
- The production function is not completely specified or known (Leibenstein 1966).

These assumptions more thoroughly explain increases in firm productivity due to labor incentives and conversely reductions in firm cost per unit of output without capital increases;

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differences in managerial ability; and why a cooperative might be found operating in an area of its production function where average costs are rising, more specifically stage I of production (Gould and Lazear).

**Federated Cooperatives**

In the case of small-scale cooperatives joint action on more than a local level may be necessary to adequately overcome the market level failures most often cited as the justification for cooperative formation. Federated cooperatives provide one mechanism through which this regional cooperation can be achieved. A federated cooperative is formed and owned by individual cooperatives in order to provide them with services which they individually do not have the volume or resources to achieve (Vilstrup, Cobia, and Cropp). The benefits of a federated cooperative include the reduction of competition between local small-scale cooperatives and the larger resource pool with which these cooperatives can address the comparative disadvantage, market level failures, and intra-firm inefficiency factors disposing them to failure. Federations also provide a mechanism through which to analyze cooperative problems, develop appropriate innovations to address these problems, and encourage the adoption of these innovations by the member cooperatives. The ultimate purpose of these innovations is to reduce cooperative costs and result in a downward shift in the cooperatives' total and marginal cost curves. It is important to note that without the support of economically viable members a federation of cooperatives is also prone to failure.
Chapter Three: Development and Implementation of HPF Services

The services developed for the HPF and their implementation were part of a federated cooperative approach to improve the financial viability of small-scale vegetable marketing cooperatives. The work described in this thesis initially focused on the ten cooperatives targeted by the Lively and Bell study that was introduced in chapter one. These ten cooperatives were targeted by Lively and Bell as either current or potential members of the HPF based on the following criteria: (1) active membership and level of vegetable production, (2) commitment to marketing through the cooperative, (3) the level of management expertise, (4) the board of directors' degree of involvement in decision making, and (5) the overall financial condition of the cooperative. The targeted cooperatives included four members of the HPF (Cumberland Farm Products, Inc., Monticello, KY; Southwestern North Carolina Farmers Cooperative, Inc., Murphy, NC; Tri-State Growers Cooperative, Tazewell, TN; and Southwestern Virginia Vegetable Growers, Marion, VA) and six other vegetable cooperatives from across the South (Hermitage Pink Tomato Marketing Association, Inc., Hermitage, AR; Haywood County Cooperative Fruit and Vegetable Association, Waynesville, NC; Macon County Cooperative Fruit and Vegetable Association, Inc., Franklin, NC; Southside Virginia Produce Cooperative, Halifax, VA; Lauderdale County Produce Growers Cooperative, Ripley, TN; and Horry Produce and Marketing Association, Conway, SC)(Lively and Bell).

Over the five year duration of the study some of these cooperatives dropped out of the study and others joined. By 1988 the HPF had a membership of thirteen cooperatives located in nine
states: Alabama, Arkansas, Illinois, Kentucky, Mississippi, North Carolina, Oklahoma, Tennessee, and Virginia all of which were included in this study (Table 3). While developing services for these cooperatives, this study also depended on guidance from an advisory committee made up of cooperative leaders and representatives from the ACS, the AMS, some state Extension Services, and the Tennessee Valley Authority (TVA).

**Determining Needed Services**

The 1983 survey conducted by Lively and Bell solicited information from the targeted cooperatives on what services they would be interested in receiving from a federation. The cooperatives expressed the most interest in marketing information, purchasing services, and a newsletter to facilitate communication among federation members (Table 4). Record keeping, legal services, and financial planning/accounting/tax management services were rated almost as high. The cooperatives expressed the least interest in services such as coordination of sales, centralized selling, and managerial/technical assistance.

Many of these proposed services, although needed, could not be effectively performed by the individual cooperatives because of their relatively small size. Therefore, this study used these survey results as a guide to develop a comprehensive package of services for the HPF member cooperatives which addressed specific market failures and intra-firm inefficiencies discussed earlier in this thesis. A microcomputer network was determined to be one way in which several of these needs could be met. Microcomputer software packages were either developed, subscribed to, or purchased for the following applications: market information, communications, packinghouse record keeping, spreadsheets, accounting, and payroll. Other HPF services which did not require the use of microcomputers by the member cooperatives were also analyzed and most were subsequently developed through this study. These services included joint purchasing of supplies, educational programs, marketing support, cen-

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25 The HPF member cooperatives ranged in size from an average membership of ten to five hundred members with average gross sales from 80,000 to 1,400,000 dollars in the years 1984-1985.
### Table 3. Yearly Participation of Cooperatives in HPF Study.

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*These cooperatives are the 10 cooperatives targeted by Lively and Bell in 1983.
Table 4. Level of Interest in Potential Federation Services by Targeted Southern Vegetable Marketing Cooperatives.

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<tr>
<th>Service</th>
<th>Most Interest</th>
<th>Some Interest</th>
<th>Least Interest</th>
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<tr>
<td>Market information</td>
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<td>7.8</td>
<td>7.0</td>
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<tr>
<td>Purchasing services b</td>
<td>8.2</td>
<td>7.6</td>
<td>6.4</td>
</tr>
<tr>
<td>Newsletter c</td>
<td>8.2</td>
<td>7.4</td>
<td>6.2</td>
</tr>
<tr>
<td>Record keeping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal services</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Financial planning, accounting &amp; tax mgmt.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordination of sales</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centralized marketing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managerial &amp; technical assistance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Average response on a scale of 1 to 10 with 1 representing low level of interest and 10 representing high level of interest.

b Purchase of supplies for the cooperative or its members through group buying schemes.

c A newsletter was suggested as a possible means to facilitate communication among HPF members.

Adapted from Kirkpatrick and Bell, p.9.
tralized marketing, a newsletter, and legal services. Because these services were developed by this study through ACS and AMS funding, the HPF only charged a nominal twenty-five dollar per year membership fee. Therefore cost was not a limiting factor for cooperatives wishing to participate in these services.

**Microcomputer Applications**

The microcomputer services, especially the record keeping program, quickly became the major emphasis of the study. It was quickly recognized that the accuracy, speed, and consistency of the microcomputer could greatly improve the efficiency of office staff employed by the cooperatives. In addition, the high staff turnover rates experienced by most small-scale cooperatives and the highly seasonal pressures on the cooperatives' staff necessitated that the study locate or develop programs which could provide consistent information and be easily learned, recalled, and used by office help unfamiliar with microcomputers.

The initial microcomputer work done in 1984 by Lively and Bell became the foundation of that done by Kirkpatrick and Bell in 1985 through 1988. After the 1983 survey Lively and Bell directed the development of two basic microcomputer programs for use by the targeted cooperatives during the 1984 marketing season; one for record keeping and the other for market information. Seven IBM\(^2\) Personal Computers (256k), IBM Graphics Printers, and 1200 Baud Hayes Smartmodems\(^3\) were purchased for use by most of the targeted cooperatives on a two-year lease\(^4\). The cost of each lease was waived by the study in exchange for the coop-

---

\(^2\) IBM is the standard abbreviation for International Business Machines, P.O. Box 1328-W, Boca Raton, Florida 33432.

\(^3\) Hayes Smartmodems are a product of Hayes Microcomputer Products, Inc., 5923 Peachtree Industrial Blvd., Norcross, Georgia 30092.

\(^4\) Six of the computers were placed in cooperatives on a two year rent-free lease and the seventh computer was located in the study office at VPI & SU. At the end of the two year lease, the cooperatives were given the option to buy the computers at salvage value in order to continue using all software developed through the project. Five of the six cooperatives purchased the leased computers, the sixth cooperative bought a new computer, and the sixth rental computer was sold to another HPF cooperative.
eratives’ assistance in program development. Both the CROSSTALK\textsuperscript{28} and SUPERCALC\textsuperscript{30} commercial software packages, were also purchased for use by the cooperatives to support the microcomputer programs developed by Lively and Bell. Those initial efforts by Lively and Bell were so successful that expansion and refinements of both programs were requested by the cooperatives and others working with the study. As a result, the more exhaustive and detailed work reported in this thesis was begun.

Record Keeping

Record keeping was considered especially important to this study for several reasons. Disciplined record keeping is a vital management tool for marketing cooperatives (Roy; United States Department of Agriculture/Agricultural Cooperative Service) and poor management practices are among the most frequently cited reasons for cooperative failures (McBride; United States Department of Agriculture/Agricultural Cooperative Service). The poor records of grower and buyer transactions in many HPF cooperatives were thought to be a major factor in problems such as the embezzlement of funds, the inadequacy of financial analyses, and the dissatisfaction of many grower-members. Because no commercial programs were available, the VEGMARC II\textsuperscript{31} Record Keeping Program was developed to improve the management practices of these cooperatives by addressing the record keeping problems of the cooperatives and providing a mechanism through which they could quickly and accurately pool prices received for their product, while decreasing the amount of time required to calculate these pooled prices.

\textsuperscript{28} CROSSTALK is a copyrighted program of Microstuff, Inc., 1845 The Exchange, Suite 140, Atlanta, Georgia 30339.

\textsuperscript{30} SUPERCALC is a copyrighted program of SCORCIM/IUS Micro Software, 2195 Fortune Drive, San Jose, California 95131.

\textsuperscript{31} VEGMARC II is a copyrighted program of Virginia Tech Intellectual Properties, 1900 Kraft Drive, Research Building 2, Suite 107, Blacksburg, Virginia 24060.
In 1984 a consultant was hired through this study to write a software package for the IBM PC and IBM compatibles using a computerized record keeping system developed by the TVA for Radio Shack computers as a template. The resulting program was written in the dBASE II\textsuperscript{32} computer language, compiled, and distributed to the cooperatives in time for their 1984 marketing season. This version of the program was designed to accept grower/buyer information, transactions, and per box packing house fees. This information was used by the program to print grower/buyer directories, calculate pool period prices, calculate grower returns, and print several reports from the transaction data. After one season of field testing it was clear that the cooperatives wanted more out of the program. Feedback obtained from 15 different cooperatives during the next three years of field testing in Alabama, Kentucky, North Carolina, Tennessee, and Virginia resulted in numerous program expansions and refinements. During this test period on-site and telephone support were provided by this author to cooperatives using the program. In addition to this support, a user’s manual was written and distributed for all versions of the program used during these marketing seasons (Kirkpatrick 1985, 1988).

In 1986 after significant changes, the program was named VEGMARC. The latest version of the program, VEGMARC II, was converted to dBASE III\textsuperscript{33} in 1987 and rewritten for use with computers containing at least 512k of RAM memory and a hard disk. The hardware changes became a necessity as a result of the expansion of program capabilities requested by the cooperatives. The study aided the cooperatives in this change by purchasing 640k of RAM memory for those cooperatives lacking it and installing the hard disks purchased by the cooperatives.

The VEGMARC II program is menu driven and has been designed for the computer novice. The program will keep accurate records and save the employees of vegetable marketing co-

\textsuperscript{32} dBASE II is a copyrighted program of the Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, California 90230.

\textsuperscript{33} dBASE III is a copyrighted program of the Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, California 90230.
operatives time and effort by performing repetitive calculations. The program will be described in the order operations appear on the Main Menu (Figure 8).

**Figure 8, Menu 2:** VEGMARC II has limited trouble shooting capabilities though the reindexing procedure which can retrieve data scrambled by a power surge, improper exiting of the program, or similar situations most of the time. The program can be customized for each cooperative’s specific equipment by selecting the screen display, printer settings, disk drive names, and data entry confirmation procedures to be used by the individual cooperative. VEGMARC II will maintain transaction records for 35 different crops and virtually unlimited grade and size combinations for each of these crops. The program will store up to eight packinghouse fees to be deducted on a per box basis from the growers’ returns for each of the commodity, grade, and size combinations stored in the program. Four of these fees are designed to be deducted on a percentage basis and the other four on a flat fee basis. One time and limited use fees, independent of the number of boxes packed, can also be deducted from the growers’ returns by the program. These one time and limited use fees are especially important to cooperatives charging membership fees, bulk bin fees, and cull fees. The information contained within specific data files can be removed to allow the cooperatives to easily enter and remove practice data before each packing season.

**Figure 8, Menu 3:** VEGMARC II will store a large database of grower and buyer names, addresses, phone numbers, and identification codes (ID). The program easily allows the user to edit all information for each grower and buyer except their permanent ID. Grower and buyer directories, summary lists, and mailing labels can also be printed.

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34 Packinghouse fees are deducted on a per box basis for costs incurred by the cooperative as a result of handling the product.

35 A bulk bin fee is a one time dump charge to growers for delivering a bulk bin, or large crate, of product to the cooperative regardless of the number of marketable boxes that are packed out of that bin.

36 A cull fee is charged on boxes of substandard product generally to encourage growers to field grade their product.
Figure 6. The Menus of VEGMARC II: Source Kazmierczak and Taylor, p. 150.
Figure 8, Menu 4: Transactions for each commodity, grade, and size combination occurring through the cooperative are entered into VEGMARC II attached to the ID of the grower or buyer whose produce is involved. Figure 9 shows how a transaction of 75 boxes of 14 count broccoli was entered into the program for Lynch from ticket number 40 written on July 13, 1987. If necessary, the program allows the cooperative to withhold grower and buyer transactions of an uncertain nature, such as transactions without a confirmed sales price, from the pool price calculations. Information in all transactions can be edited with the exception of the transaction’s permanent ticket or invoice number. To include a previously withheld transaction in the pool price calculation, that transaction is edited through the normal editing procedures.

Figure 8, Menu 5: Four major types of daily reports can be printed from the transaction data before it is used in any calculations. These are the Grower, Buyer, Packout, and Loadout Daily Reports which present the raw transaction information from various points of view. The grower/buyer report lists the day’s transactions for each grower/buyer doing business with the cooperative that day. The packout report displays the transaction data for each commodity packed by the cooperative and the loadout report displays the transaction data for each commodity sold by the cooperative.

Figure 8, Menu 6: VEGMARC II will calculate a pool period price for any combination of one to six crops or for all crops with transactions occurring between the beginning and ending dates of the chosen pool period. A separate pool period price is computed for each commodity, grade, and size combination. The program allows the cooperative to override each of these calculated pool period prices with prices determined by the cooperative. Pool period prices without matching packing fees are flagged and can be printed to the screen to help the user catch possible typographical errors before calculating the grower’s returns. To calculate the grower’s returns the program multiplies the appropriate calculated or edited pool period price by the units of that commodity, grade, and size combination each grower sold through the cooperative. The per box packinghouse fees and one time/limited use fees are then de-
Figure 9. The Grower Transaction Screen from VEGMARC II: Source Kazmierczak and Taylor, p. 152.
ducted from this amount to obtain the net return to the grower. All grower transactions without a matching pool period price are also flagged by the program to help the cooperative avoid inadvertently missing payments to growers. A list of the calculated and edited pool period prices can be printed to document the actual prices paid to the growers.

The flexibility of the program in allowing the user to choose the length of the pool period, withhold transactions from pool price calculations, and override the calculated pool price allows VEGMARII to be used by cooperatives employing vastly different operating procedures. For example, the pool periods of cooperatives currently using the program range from three days to a whole season. This flexibility accommodates cooperatives not wishing to lower the pool price for everybody because of one grower’s bad load. It also allows cooperatives to pay a portion of the pool price shortly after delivery and the remainder at the end of the marketing season.

Figure 8, Menu 7: The Grower, Buyer, Packout, and Loadout Pool Period Reports printed by VEGMARII arrange the same pool period data in different ways. Examples of Pool Period Grower and Pool Period Packout Reports shown in Figure 10 and Figure 11 contain pool period information on the same transactions displayed from different perspectives. Figure 10 displays the information on a grower basis complete with item totals for each commodity, grade, and size combination and per grower totals of all combinations. The 14 count broccoli entered for Lynch earlier in Figure 9 is shown here as the first listing with the per box pool period price of $8.156, the gross amount of $511.70 for the 75 boxes, the packing fee deductions, and the net amount of $409.11 owed to Lynch by the cooperative. A grower total of 161 boxes and $874.37 net is listed under all transactions for Lynch as well as a cooperative total of 2,150 boxes and $11,679.66 net at the bottom of the report. Figure 11 arranges the same information contained in Figure 9 according to the quantity of each commodity, grade, and size packed by the cooperative with totals for each day and period. The 75 boxes of 14 count broccoli appear in the second listing on this report along with the pool period price, gross, packing fee deductions, and net for that transaction. The transactions for each com-

Chapter Three
modity, grade, and size combination are totaled for each day and the entire pool period. A cooperative total also appears at the bottom of this report showing 2,150 boxes packed, gross dollars owed, packing fee deductions to be retained, and $11,679.86 net owed to all growers for the pool period.

**Figure 8, Menu 8:** Once the pool period price and the grower returns have been calculated, VEGMARC II is able to post the historical data from the closed pool period to the year-to-date files. The posting procedure helps maintain the speed of each new pool period calculation by transferring old pool period data into a yearly file. Although the transaction data cannot be edited after it is posted, it can be accessed through the Year-To-Date Reports at any time. Each of the four major Year-To-Date Reports can be printed in detail, including every transaction that occurred during the season, or they can be printed in summary including only totals for certain time periods, growers, buyers, or crop combinations. VEGMARC II also allows the user to selectively clear each type of year-to-date file in order to begin a new marketing season.

**Figure 8, Menu 9:** Lastly, VEGMARC II also has the capability to maintain multiple checking accounts for the cooperative. New checks can be entered, edited, and printed for growers, buyers, and other people or companies providing services to the cooperative on any checking account the cooperative maintains on the computer. Checks can also be written and held for issuing at a later date. Deposits can be entered and edited, the checkbook balanced, and check or deposit reports printed for each of the checking accounts.

**Market Information**

In 1983 the targeted cooperatives ranked current market information as the most important service a federation could offer to its members. The problems faced by small marketing cooperatives selling to large wholesale buyers and their inherent distrust of brokers were two major factors influencing this ranking. In another question on the same survey, the targeted
| Grower: Lynch | Grower ID: LYNJ | 07/13/87 | 40 | 75 | 8.156 | 611.700 | 122.340 | 75.000 | 5.250 | 409.11 |
| Grower ID: LYNJ | 07/13/87 | 40 | Item Total | 75 | 611.700 | 122.340 | 75.000 | 5.250 | 409.11 |
| Grower: Lynch | Grower ID: LYNJ | 07/13/87 | 40 | 86 | 8.100 | 696.600 | 159.320 | 86.000 | 6.020 | 465.26 |
| Grower ID: LYNJ | 07/13/87 | 40 | Item Total | 86 | 696.600 | 159.320 | 86.000 | 6.020 | 465.26 |
| Grower: Minor | Grower ID: MINJ | 07/11/87 | 10 | 1000 | 8.156 | 8156.000 | 1631.200 | 1000.000 | 70.000 | 5454.80 |
| Grower ID: MINJ | 07/11/87 | 10 | Item Total | 1000 | 8156.000 | 1631.200 | 1000.000 | 70.000 | 5454.80 |
| Grower: Minor | Grower ID: MINJ | 07/11/87 | 10 | 989 | 8.100 | 8010.900 | 1602.180 | 989.000 | 69.230 | 5350.49 |
| Grower ID: MINJ | 07/11/87 | 10 | Item Total | 989 | 8010.900 | 1602.180 | 989.000 | 69.230 | 5350.49 |
| Grower Total | | | | 1989 | 16166.900 | 3233.380 | 1989.000 | 139.230 | 10805.29 |
| Coop Total | | | | 2150 | 17475.200 | 3495.040 | 2150.000 | 150.500 | 11679.66 |

**Key to Abbreviations:**
- **P-PRICE:** Pool Price
- **PK-FEE:** Packing Fees
- **RET.CAP.:** Retained Capital
- **M-FEES:** Miscellaneous fees

**Figure 10.** The Pool Period Grower Report of VEGMARC II: Source Kazmierczak and Taylor, p. 153.

Chapter Three
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<th>Date</th>
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<th>PK-Fee</th>
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<tr>
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<td>696.600</td>
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<td>17475.200</td>
<td>3495.040</td>
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</tbody>
</table>

Key to Abbreviations:
P-PRICE: Pool Price                      RET-CAP: Retained Capital
PK-FEE: Packing Fees                      M-FEES: Miscellaneous Fees

Figure 11. The Pool Period Packout Report of VEGMARC II: Source Kazmierczak and Taylor, p. 154.
cooperatives expressed a higher level of dissatisfaction with their cooperative’s method of obtaining market information than any of the other business functions handled by their cooperative, including method of sale, record keeping, financial planning, and purchasing of supplies (Lively and Bell).

Market information was collected and distributed in two ways over the five year duration of this study (Kirkpatrick and Bell). Both methods were partially subsidized by this study and utilized microcomputers, telephone modems, CROSSTALK communication software, and the timesharing capabilities of a computer network to provide the cooperatives with timely access to current marketing information and on-line communication channels with other HPF cooperatives. The first method involved the HPF accessing the AMS daily market report using the menu driven MARCNEWS microcomputer program developed through this study. During the 1984 marketing season, MARCNEWS allowed the cooperatives to dial a toll-free number during working hours to access the market information which had been loaded onto the microcomputer located in the author’s office at VPI & SU. In 1985, this program allowed the cooperatives to access the same AMS market information in the cooperative’s mailbox on the DAILCOM\textsuperscript{37} timesharing computer network twenty-four hours a day. This refined version of the MARCNEWS program also allowed the cooperatives to send computer messages to other cooperatives. The actual menu of the second version of the MARCNEWS program is shown in Figure 12.

MARCNEWS provided each cooperative access to the same slate of market information which included seven crops, nine shipping points, and eight terminal markets (Table 5). This slate of information was determined to be one which could meet the needs of all cooperatives. The market information was sent daily to each cooperative’s timesharing mailbox to be retrieved by the cooperative to evaluate prices being received and to keep each cooperative’s grower members informed of current market conditions. The market information was made available

\textsuperscript{37} Dialcom is a servicemark of ITT Dialcom, Inc., 1109 Spring Street, Silver Spring, Maryland, 20910.
<table>
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<th>Command</th>
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<tr>
<td>F1 Disc</td>
<td>to see the names of messages on your disc.</td>
</tr>
<tr>
<td>F2 Print</td>
<td>to read messages on your disc.</td>
</tr>
<tr>
<td>F3 Trash</td>
<td>to delete messages from your disc.</td>
</tr>
<tr>
<td>F4 Write</td>
<td>to write messages onto your disc.</td>
</tr>
<tr>
<td>F5 Send</td>
<td>to schedule messages to be sent.</td>
</tr>
<tr>
<td>F6 Read</td>
<td>to read mail from selected coops.</td>
</tr>
<tr>
<td>F7 Call</td>
<td>to make the connection to DIALCOM.</td>
</tr>
<tr>
<td>F8 Coops</td>
<td>to see a list of coops and addresses.</td>
</tr>
<tr>
<td>F9 Market</td>
<td>to get Market News for specified dates.</td>
</tr>
<tr>
<td>F10 Exit</td>
<td>to exit from the Mail System to DOS.</td>
</tr>
</tbody>
</table>

Figure 12. MARCNEWS Main Menu: Source Kirkpatrick and Bell, p. 15.
over the network one day after its collection and was five to six days faster than the next best source of market information available to most cooperatives prior to this study, The Packer38. This vegetable industry newspaper published market prices for fruits and vegetables on a weekly basis. The typical structure of the 1984/1985 market news report generated by the MARCNEWS program is illustrated in Figure 13 using the Asheville, NC, shipping point and Atlanta, GA, terminal point price quotes for 20 August, 1985. On this day medium heads of green cabbage in 1 3/4 bushel crates were selling for $3 freight paid by the buyer (FOB) at the Asheville, North Carolina shipping point. Cabbage of the same type and size from Wisconsin, Virginia, and Ohio were selling between $4 and $4.50 not FOB at the Atlanta, Georgia terminal market. Medium heads of red cabbage from North Carolina and Virginia were selling between $6.75 and $7.50 a head although a few were as high as $8.00. The demand for cabbage at both markets was steady.

Although the AMS market news was helpful, more complete market information was available from the PRONET39 commercial market news system. PRONET extended a group rate to the HPF and its member cooperatives in 1986 and this study subsidized a portion of the resulting costs. The cooperatives were encouraged to enroll and PRONET became the second method of disseminating current market information to the HPF cooperatives. This method was the most timely and the thus most desirable method developed through this study. The information on this system was updated two or more times a day and each cooperative could specify the commodities and markets for which they obtained information. The Main Menu of the PRONET timesharing system is shown in Figure 14.

PRONET's Late Industry News offers headlines and concise stories affecting the produce industry. The Commodity Marketscope gives complete coverage on 35 major fruit and vegeta-

38 The Packer is owned by Vance Publishing Corporation, 7950 College Blvd., P.O. Box 2939, Shawnee Mission, Kansas 66201.

39 PRONET is owned by Vance Publishing Corporation, 7950 College Blvd., P.O. Box 2939, Shawnee Mission, Kansas 66201.
<table>
<thead>
<tr>
<th>Crops</th>
<th>Terminal Markets</th>
<th>Shipping Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broccoli</td>
<td>Atlanta, GA</td>
<td>Salinas, CA</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Chicago, IL</td>
<td>Pompano Beach, FL</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>New Orleans, LA</td>
<td>Thomasville, GA</td>
</tr>
<tr>
<td>Peppers</td>
<td>Boston, MA</td>
<td>Benton Harbor, MI</td>
</tr>
<tr>
<td>Sweet corn</td>
<td>Detroit, MI</td>
<td>Asheville, NC</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>St. Louis, MO</td>
<td>Faison, NC</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>Cincinnati, OH</td>
<td>Columbia, SC</td>
</tr>
<tr>
<td></td>
<td>Pittsburgh, PA</td>
<td>Onley, VA</td>
</tr>
</tbody>
</table>

Source: Kirkpatrick and Bell, p. 14.
From: D.Wilson (VTU009) Posted: Wed 21-Aug-85 7:12 EDT Sys 46 (266)
Subject: MARKET REPORT

ASHVILLE NC FEDERAL-STATE AUG 20
WEATHER PARTLY CLOUDY 85-86

--WESTERN NORTH CAROLINA
SALES F.O.B SHIPPING POINT BASIS
CABBAGE: Offerings moderate Demand moderate
Market about steady 1 3/4 Bushel crates of
cartons Green medium 3.00 Few higher

ATLANTA, GA FEDERAL-STATE AUG 21
WEATHER Clear 70-91

BROCCOLI: STEADY. Ctn bchd CA 14s 7.50-8.00
few higher.
CABBAGE: STEADY. 1-3/4 bu crts/ctns Green Medium
WI VA OH 4.00-4.50 mostly 4.00 few 3.500 few
higher 50 lb sacks NC WI 3.00-4.00 mostly 3.50
Red NC VA 6.75-7.50 few 8.00.

Figure 13. MARCNEWS Market Report: Source Kirkpatrick and Bell, p. 14.
** PRONET Main Menu **

1 Late Industry News
2 Commodity Marketscope
3 Weather
4 Red Book
5 Electronic Mail

Enter item number:

Figure 14. PRONET Main Menu: Source Kirkpatrick and Bell, p. 15.
ble commodities marketed in selected terminal markets and shipping points. The price quotes on 15 August, 1986 for the Asheville, NC, shipping point and the Atlanta, GA, terminal market are shown in Figure 15. On this date medium heads of green cabbage boxed in 1 3/4 bushel crates were selling between $6 and $6.50 FOB and demand was moderate at the Asheville, North Carolina shipping point located in Western North Carolina. On the same day at the Atlanta, Georgia terminal market demand was steady and comparable cabbage was selling between $7.50 and $8.50 with North Carolina cabbage obtaining a premium. Red cabbage was selling between $9 and $11 on the same day at the Atlanta market.

The exact combination of commodities and markets needed by each cooperative could be saved to disk for later printing without spending on-line time sorting through information for a specific crop. Special files called "profiles" could be created in PRONET to automatically access the same commodity information each time the cooperative logged on. The Weather option allowed the PRONET users to stay informed of weather conditions in other growing and shipping areas. An on-line Red Book was available to Red Book subscribers to keep them abreast of the most current credit information. The Electronic Mail option allowed communication between member cooperatives using the system or with any other PRONET subscribers.

Financial Planning and Management

Most of the HPF cooperatives did little financial planning and management prior to this study. Therefore spreadsheet application packages were developed on the SUPERCALC commercial spreadsheet program and distributed to HPF members to encourage them to plan and analyze their operations more thoroughly. Financial planning spreadsheets also were developed for the HPF to help the organization weigh the consequences of offering new services and analyze

---

40 One and three quarter bushel crates of cabbage weigh 50 pounds.

41 Red Book is a subscription publication listing the credit information on all buyers and sellers involved in the produce industry and is published by Vance Publishing Corporation, 7950 College Blvd., P.O. Box 2939, Shawnee Mission, Kansas 66201.
** PRONET Price Quotes **

08/14/86 02:58 PM CDT Source: F-S Mkt Nws #CAB210

Shipping Point Availability and Prices

FOLLOWING ISSUED BY USDA FOR 08/14/86

---WESTERN NORTH CAROLINA
SALES F.O.B. SHIPPING POINT BASIS
CABBAGE: Offerings moderate Demand moderate
Market higher 1 3/4 bushel crates or
cartons Green medium 6.00-6.50 Few higher

08/14/86 11:05 AM CDT Source: F-S Mkt Nws #CAB320

Terminal Market Reports

ATLANTA
CABBAGE: About steady 50 lb cartons and crates
Green Medium WI 7.50-8.50 mostly 7.75-8.50
IL 7.50 NC 7.75-8.50 Sacks 50 pounds WI 8.00
NY large 6.50-7.00 occas lower Red medium 50 lb
cartons and crates WI 10.00 NC 9.00 NY 10.00-
11.00 some 9.00 50 lb sacks NY 9.00

Figure 15. PRONET Market Report: Kirkpatrick and Bell, p. 16.
the effect of different levels of participation in various programs (Bell and Kirkpatrick). These particular spreadsheets were used solely by the advisory committee, the HPF management, and the HPF board of directors.

The spreadsheet application packages developed through this study were designed to fill the cooperatives’ needs in certain management, accounting, and record keeping areas not covered by the VEGMARC II Record Keeping Program and the REDWING Accounting and Payroll\(^2\) programs to be discussed later. Three of the application packages developed through this study will be described in this thesis: the patronage refunds, container inventory, and break-even analysis packages.

The patronage refund application spreadsheet, Revolving Fund Account, calculates the patronage refunds for cooperative members based on business volume done through the cooperative (Figure 16). It also calculates the amount of the refund to be paid in cash and the amount to be issued in certificate based on a predetermined percentage. The example in Figure 16 shows that Quality Tomato Cooperative is distributing a two percent patronage refund of which it will pay twenty-five percent in cash and seventy-five percent as a certificate for future redemption. The cooperative’s total business volume was 1,750 boxes and the total patronage refund from the cooperative is $34 of which it will pay $8.50 in cash. A.T. Smith delivered 1,000 boxes to the cooperative and will receive a $20 patronage refund of which $5 will be in cash.

The inventory application, Grower Inventory of Containers, keeps a running total of the number of bins the cooperative has rented to the growers (Figure 17). In addition, the spreadsheet maintains a record of the number of bins each grower has rented, returned, and the amount of rental fees owed the cooperative. The example in Figure 17 shows that the cooperative owns 300 containers of which 90 are currently rented to member growers for fifteen cents

\(^2\) REDWING Accounting and Payroll programs are marketed by REDWING Business Systems, 610 Main Street, Red Wing, Minnesota 55066.
### Quality Tomato Cooperative
#### Revolving Fund Account
**JULY - SEPTEMBER 1986**

<table>
<thead>
<tr>
<th>ENTER REFUND PERCENT</th>
<th>PERCENT CERTIFICATE</th>
<th>TOTAL BUSINESS VOLUME</th>
<th>TOTAL PATRON'S REFUND</th>
<th>TOTAL ADJUSTMENTS</th>
<th>TOTAL CASH REFUND</th>
<th>TOTAL PATRON'S VOLUME</th>
<th>TOTAL CERTIFICATES REFUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>=&gt; .02</td>
<td>=&gt; .75</td>
<td>=&gt; 1750.00</td>
<td>=&gt; 34.00</td>
<td>=&gt; 50.00</td>
<td>=&gt; 8.50</td>
<td>=&gt; 1700.00</td>
<td>=&gt; 25.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><em>GROWERS</em></th>
<th><em>BUSINESS</em></th>
<th><em>ADJUST-</em></th>
<th>PATRON'S</th>
<th>PATRON'S</th>
<th>REFUND PAID IN:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME OR ID</td>
<td>VOLUME</td>
<td>MENTS</td>
<td>VOLUME</td>
<td>REFUND</td>
<td>CASH</td>
</tr>
<tr>
<td>A.T. Smith</td>
<td>1000.00</td>
<td>1000.00</td>
<td>20.00</td>
<td>5.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Jim Brown</td>
<td>500.00</td>
<td>500.00</td>
<td>10.00</td>
<td>2.50</td>
<td>7.50</td>
</tr>
<tr>
<td>Bob James</td>
<td>250.00</td>
<td>50.00</td>
<td>200.00</td>
<td>4.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

---

**Figure 16.** SUPERCALC Patronage Refund Application Package: Source Kirkpatrick and Bell, p. 17.
each. The total rental fees which the cooperative can collect so far are $54.75. A record of John Jones rental and return of containers is kept for each day a transaction takes place. As of October 12, John Jones has rented 180 containers from the cooperative and returned all but 10 of these containers. He owes the cooperative rental fees $27.00.

The break-even analysis spreadsheet allows the marketing cooperative to weight the packing expenses of the cooperative between two or three crops to determine the break-even packing fees that need to be charged for each crop (Figure 18). In this example the cooperative enters 40,000 boxes of tomatoes as the base from which the incremental break even analysis will start. Each increment is set at 2,000 boxes, the sales fee at $6, the brokerage fee at $.24, and the packing and other fees at $2.60. This cost structure would leave the growers with a net of $3.16 per box delivered to the cooperative. Under these assumptions the cooperative would break even between 46,000 and 48,000 marketable boxes delivered to the cooperative. If the cooperative expects to market less than 46,000 boxes or more than 48,000 boxes it can raise its fees in the first case and lower its fees in the second case in order to just cover its costs at those volumes. In order for the application spreadsheet to function, portions of the spreadsheet not shown here provide space for the cooperative to enter their fixed and variable costs as well as allocate specific percentages of these costs to each of their three major crops.

**Accounting and Payroll**

Microcomputers were again considered as a solution for the cooperatives’ accounting and payroll problems because of the large number of: employees hired, cash outlays, and accounts receivable during the cooperatives’ short marketing season. Most cooperative members of the HPF were hiring between twenty and sixty employees for a six to eight week season in which they sold between five hundred thousand and one million dollars of produce. Unlike the record keeping, market information, and financial planning situations, there were commercial programs available in this instance which could be utilized by the cooperatives.
## GROWER INVENTORY OF CONTAINERS

- **ENTER NUMBER OWNED** = 300
- **NUMBER RENTED** = 90
- **CURRENT INVENTORY** = 210
- **TOTAL RENT FEES** = 54.75

<table>
<thead>
<tr>
<th>DATE</th>
<th>RENTALS</th>
<th>RETURNS</th>
<th>NET</th>
<th>DATE</th>
<th>RENTALS</th>
<th>RETURNS</th>
<th>NET</th>
<th>RENTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BALANCE</td>
<td></td>
<td></td>
<td></td>
<td>BALANCE</td>
<td></td>
<td></td>
<td>TOTAL</td>
</tr>
<tr>
<td>NAME: John Jones</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 8</td>
<td>40</td>
<td>40</td>
<td>25</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>30</td>
<td>10</td>
<td>20</td>
<td>12</td>
<td>5</td>
<td>-5</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>30</td>
<td>-30</td>
<td>-10</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>45</td>
<td>40</td>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aug 7</td>
<td>15</td>
<td>-15</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>30</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>35</td>
<td>-35</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>20</td>
<td>20</td>
<td>0</td>
<td>R</td>
<td>27.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>15</td>
<td>-15</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Figure 17.** SUPERCALC Container Inventory Application Package: Source Kirkpatrick and Bell, p. 18.
**BREAK-EVEN ANALYSIS** *(enter crop 1)*  
= = = > TOMATOES

* Enter "Units Packed" starting volume = = = = > 40000  
* Enter quantity increase increment for "Units Packed" = = = = > 2000

<table>
<thead>
<tr>
<th>Units</th>
<th>Gross</th>
<th>Profit Or Loss</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>Packed</td>
<td>Fees</td>
<td>Cost</td>
</tr>
<tr>
<td>Sales Price</td>
<td>6.00</td>
<td>40000</td>
<td>104000</td>
</tr>
<tr>
<td>--Brokage</td>
<td>.24</td>
<td>42000</td>
<td>109200</td>
</tr>
<tr>
<td>--Adjustments</td>
<td>.00</td>
<td>44000</td>
<td>114400</td>
</tr>
<tr>
<td>--</td>
<td>.00</td>
<td>46000</td>
<td>119600</td>
</tr>
<tr>
<td><strong>GROSS RETURNS</strong></td>
<td>5.78</td>
<td>48000</td>
<td>124800</td>
</tr>
<tr>
<td>--Packing Fee</td>
<td>2.50</td>
<td>50000</td>
<td>130000</td>
</tr>
<tr>
<td>--Other Fee</td>
<td>.10</td>
<td>52000</td>
<td>135200</td>
</tr>
<tr>
<td>--Other Fee</td>
<td>.00</td>
<td>54000</td>
<td>140400</td>
</tr>
<tr>
<td>--</td>
<td>.00</td>
<td>56000</td>
<td>145600</td>
</tr>
<tr>
<td><strong>TOTAL FEES</strong></td>
<td>2.60</td>
<td>58000</td>
<td>150800</td>
</tr>
<tr>
<td><strong>GROWER NET</strong></td>
<td>3.18</td>
<td>60000</td>
<td>156000</td>
</tr>
<tr>
<td><strong>------------------------------------------</strong></td>
<td>62000</td>
<td>161200</td>
<td>140166</td>
</tr>
</tbody>
</table>

**Figure 18.** SUPERCALC Break-Even Analysis Application Package: Source Kirkpatrick and Bell, p. 18.
Available software packages were researched, and the REDWING series of accounting programs were recommended. In May 1985, this study helped establish the HPF as a REDWING dealer in order to gain cost reductions for member cooperatives. Six cooperatives then bought the payroll package and participated in a two-day training workshop organized through this study. At a later date, several of the cooperatives also bought the REDWING General Ledger, Accounts Receivable, and the Accounts Payable packages.

The main menu of the Payroll program is shown in Figure 19. The REDWING Payroll Program calculates the wages of employees paid a salary, hourly wage, piece rate, or any combination of the three. The program calculates employee deductions for social security, federal and state taxes, separates employee expenditures into projects for improved cost analysis, and prints payroll checks and employee W2 forms.

**Other HPF Services**

In addition to the microcomputer services, several other services were developed to address specific market failures affecting the financial viability of the cooperative members of the HPF. Although these services did not require the use of microcomputers in each cooperative, microcomputers were sometimes used to support or enhance these activities. Specific areas in which services were developed include educational and technical support, coordination of sales, centralized marketing, and a monthly newsletter.

**Educational and Technical Support**

The educational and technical support conducted through this study was of three separate types. First, various workshops and meetings were planned and conducted to expose the HPF cooperatives to new ideas or improve their skills in certain areas. These meetings also promoted interaction between the cooperatives, study staff, and representatives of supporting agencies. Second, extensive telephone and on-site support was provided to the HPF cooperatives participating in the various microcomputer services which were developed. Third,
Red Wing Business Systems  
Payroll System  
Version 1.5.0  

Main Menu  
1. Maintain Customization Features  
2. Maintenance Menu  
3. Enter Employee Time  
4. Payroll Reports Menu  
5. Check Writing Menu  
6. End of Period Menu  
7. Quick Check Menu  
8. Miscellaneous Menu  
9. Change System Date (Current date is 08/13/84)  
@. End Processing  

Select a Menu Item...  

Figure 19. REDWING Payroll Main Menu: Source Kirkpatrick and Bell, p. 19.
written documentation was provided for those microcomputer programs developed through the study to ensure a base level of support after the study was terminated. The result was that over the five year duration of the study, each cooperative had access to a large amount of personalized and written support.

Four HPF annual meetings and workshops were planned and conducted by the study in 1984, 1985, early 1987, and 1988 (Table 6). The study began turning over most of the annual meeting responsibilities to the HPF staff in 1989 and had completely phased out of the process by 1990. During the 1984 program, both the VEGMARC Recordkeeping and SUPERCALC application spreadsheets were demonstrated in depth. The 1985 program included training on VEGMARC, SUPERCALC application spreadsheets, MARCNEWS, PRONET time-sharing market information system, and the REDWING accounting programs. During the 1987 annual meeting and workshop the program was much broader with discussions on the effectiveness of the HPF and where it should go in the future. The 1988 annual meeting program pursued these topics even further through discussion groups addressing the topics of:

- Producing the Volumes and Qualities the Market Requires,
- Packing and Handling a Uniform Quality Product, and
- Developing Marketing and Sales Strategies.

Other workshops and tours were planned for the HPF cooperatives when special needs arose (Table 6). For example a special two-day workshop was held in 1985 for cooperatives purchasing the REDWING payroll program. The study hired a consultant who specialized in the REDWING software to conduct the workshop. Another special tour was planned and conducted in 1986 to expose the HPF cooperatives to large-scale production and marketing practices for fresh fruit and vegetables. Thirty-three representatives from the cooperatives and support agencies participated in a six-day marketing tour of the southern Florida vegetable producing area. In addition to a tour of the Palm Beach and Dade County vegetable growing areas, five major terminal market distributors/handlers in the Miami area were also...
visited to help the participants better understand the functioning of the wholesale marketing system.

The need for technical assistance on microcomputer operations and software usage increased tremendously as the membership of the HPF grew and more of the cooperatives gained access to microcomputers. Annual spring visits were made to each of the cooperatives utilizing the record keeping program to refresh the memories of the carryover staff and train new staff in the use of microcomputers, the VEGMARC II Record Keeping Program, and other software application packages. Every effort was made during each of these visits to answer all application questions and give the staff hands on practice with the program. Unlimited telephone support was given to all cooperatives before and after each of these visits.

In addition to the on-site visits and telephone support, written documentation summarizing the basics of operating the computer was prepared and distributed. Three separate comprehensive user's manuals were written and distributed for the three distinct versions of the VEGMARC II program (Kirkpatrick 1985, 1988, and Lively 1984). Documentation was also written and distributed for the MARCNEWS program.

**Coordination of Sales**

The 1986 tour of large-scale production and marketing facilities located in southern Florida was the catalyst for the formation of the HPF's Marketing Analysis and Pricing Committee for tomatoes and peppers. This tour helped the HPF member cooperatives recognize the benefits of marketing a larger volume of product over a longer period of time by exposing them to the operating procedures of the Florida Sweet Corn Exchange and the Florida Celery Exchange. While the HPF did not seek a marketing order or enforce price quotes among its members it did start a committee of several cooperative managers to analyze the current market prices, crop supply situation, and weather considerations in order to and discover a target sales price for participating cooperatives each day. Although this study did not actively participate in the

1. Annual Meeting/Workshop--Dec. 19-20, 1984--Knoxville, TN. **Purpose:** To allow Federation members to meet one another and to help familiarize these cooperatives with the use of microcomputers and the VEGMARC Recordkeeping and SUPERCALC software packages.

2. REDWING Payroll Special Workshop--May 14-15, 1985--Knoxville, TN. **Purpose:** To provide training to six cooperatives that had just purchased the REDWING Payroll software package.

3. Annual Meeting/Workshop--Dec. 18-19, 1985--Knoxville, TN. **Purpose:** To allow Federation members to interact, discuss mutual problems, and learn more about the VEGMARC Recordkeeping Program, SUPERCALC application packages, REDWING Accounting software, and the PRONET market information system.

4. Vegetable Marketing Tour--Feb. 25-March 2, 1986--Miami, FL and surrounding area. **Purpose:** To expose Federation members to large-scale vegetable marketing operations.

5. Annual Meeting/Workshop--Jan. 27-29, 1987--Knoxville, TN. **Purpose:** To evaluate the effectiveness of the HPF and its future direction.

6. Annual Meeting/Workshop--Feb. 4-5, 1988--Knoxville, TN. **Purpose:** To discuss the volume and quality of the HPF cooperative’s product, the packing and handling of that product, and the development of marketing and sales strategies for the HPF’s centralized marketing program.

Adapted from Kirkpatrick and Bell, p.22.
work of this committee, it is doubtful if it would have been organized without the other educational efforts conducted by the study.

Centralized Marketing

Several cooperative representatives have continually indicated that by marketing together HPF member cooperatives could have sufficient volume to be more effective in selling their vegetable crops, but that organizing and operating a successful centralized marketing venture would be difficult. The biggest concern associated with initiating such a program was assuring equality among the participating cooperatives and protecting the HPF's reputation in the market from being damaged by unanticipated shipments of inferior produce. The organizational concerns and varying perceptions among the cooperatives prompted this study to conduct several surveys concerning possible marketing services which could be provided by the HPF. Many of the cooperatives repeatedly rated centralized marketing low on these surveys even though the HPF leadership, viewing the large potential benefits to the individual cooperatives, continued to pursue efforts that would lead to centralized marketing.

Bell and Lively reported in their 1983 survey of the southern fruit and vegetable marketing cooperatives that centralized marketing and coordination of sales were among the three services least desired (Table 4 on page 40). In a later survey conducted by this study in November 1985, the same trend was evident (Table 7). On an index of interest ranging from 1 to 100, the cooperatives gave a low rating (63) to the Federation establishment of a sales program for members relative to the high rating (90) to the Federation aiding member cooperatives in developing their own sales programs. In addition, the survey reaffirmed the previous trends in options such as promoting member sales (90), expanding market information availability to cooperatives (80), and helping cooperative salesmen improve their selling techniques (80). Hiring a salesman to operate a sales agency (53) and handling sales of all produce for member cooperatives (37) were among the lowest rated. A similar survey was conducted by this study in February 1986 during the marketing tour of southern Florida. Once
again, the general trend seemed to be that most of the cooperatives felt the Federation should use its resources to help individual cooperatives improve their own sales programs (Table 8). The two highest interest responses were: helping make member cooperatives more aware of market requirements, and expanding market information available to member cooperatives. The two lowest responses were: establishing a uniform brand label under which member cooperatives would sell, and initiating a centralized agency to sell members' produce through an exclusive sales agreement.

The HPF used these survey results in formulating their approach to centralized marketing. The previously mentioned Marketing Analysis and Pricing Committee for members selling tomatoes and peppers was the HPF's first formal step in the direction of centralized marketing. At about the same time this committee began operation the HPF began collecting projected production data from the cooperatives. This data was entered into the spreadsheet application package written for the HPF as a whole to determine under what conditions the HPF could operate a centralized sales agency. The HPF was able to use the projections generated by the application spreadsheet to gain funding to hire a Market Development Specialist. This specialist had three main objectives. The first was to develop and conduct programs with wholesale vegetable marketing firms and institutions to develop expanded market outlets for vegetables produced by HPF cooperatives. The second was to develop and conduct programs with the HPF cooperatives to help them understand and meet the market requirements of wholesale vegetable marketing firms and institutions. The third was to further develop plans and work toward initiating centralized marketing of vegetables for HPF cooperatives. During the 1988 marketing season, the Marketing Specialist concentrated his efforts on the second of his three objectives. This study sponsored some research conducted by R. Kazmierczak and Bell which targeted the first of the objectives and examined the potential for the HPF to market produce to large wholesale buyers. The HPF board of directors, federal and state agencies, and this study addressed the third objective and worked toward a comprehensive plan that would allow the HPF to market each member's produce without undue risk to any

Chapter Three
Table 7. HPF Members' Attitudes Concerning HPF Marketing Activities as Determined by a November 1985 Survey.

<table>
<thead>
<tr>
<th>Question</th>
<th>Priority Index *</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Share credit information about buyers</td>
<td>93</td>
</tr>
<tr>
<td>2. Promote member cooperative vegetable sales</td>
<td>90</td>
</tr>
<tr>
<td>3. Help make local co-op members aware of market requirements</td>
<td>88</td>
</tr>
<tr>
<td>4. Develop new marke's</td>
<td>83</td>
</tr>
<tr>
<td>5. Exchange sales information to improve coordination of sales</td>
<td>83</td>
</tr>
<tr>
<td>6. Expand market information available to cooperatives</td>
<td>80</td>
</tr>
<tr>
<td>7. Help cooperative salesmen improve their selling techniques</td>
<td>80</td>
</tr>
<tr>
<td>8. Set quality standards</td>
<td>77</td>
</tr>
<tr>
<td>9. Provide brokerage services for member sales</td>
<td>73</td>
</tr>
<tr>
<td>10. Conduct merchandising activities</td>
<td>70</td>
</tr>
<tr>
<td>11. Handle sales of some produce of member cooperatives</td>
<td>60</td>
</tr>
<tr>
<td>12. Hire a salesman and operate a sales agency</td>
<td>53</td>
</tr>
<tr>
<td>13. Arrange for cooperative representatives to visit markets</td>
<td>50</td>
</tr>
<tr>
<td>14. Help expand local sales</td>
<td>40</td>
</tr>
<tr>
<td>15. Handle sales of all produce of member cooperatives</td>
<td>37</td>
</tr>
</tbody>
</table>

* Priority Scale

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority Index</td>
<td>100</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Kirkpatrick and Bell, p. 23.
Table 8. HPF Members’ Attitudes Concerning HPF Marketing Activities as Determined by a February 1986 Survey.

<table>
<thead>
<tr>
<th>Question</th>
<th>Priority Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Help make local cooperative members aware of market requirements</td>
<td>94</td>
</tr>
<tr>
<td>2. Expand market information available to member cooperatives</td>
<td>90</td>
</tr>
<tr>
<td>3. Help member cooperative salesmen improve their selling techniques</td>
<td>88</td>
</tr>
<tr>
<td>4. Conduct workshops for member cooperatives on mutual marketing problems</td>
<td>85</td>
</tr>
<tr>
<td>5. Conduct marketing tours for members</td>
<td>79</td>
</tr>
<tr>
<td>6. Share credit information about buyers</td>
<td>77</td>
</tr>
<tr>
<td>7. HPF staff visits new markets to promote purchases of member vegetables</td>
<td>77</td>
</tr>
<tr>
<td>8. HPF staff conduct merchandising and point-of-sale activities with the trade to encourage purchase of member vegetables</td>
<td>67</td>
</tr>
<tr>
<td>9. HPF staff conduct advertising program with the trade to encourage purchase of member vegetables</td>
<td>67</td>
</tr>
<tr>
<td>10. Set and monitor quality standards for member sales</td>
<td>62</td>
</tr>
<tr>
<td>11. Establish a uniform label under which member cooperatives will sell</td>
<td>54</td>
</tr>
<tr>
<td>12. Initiate a centralized agency to sell for members on an exclusive sale agreement</td>
<td>54</td>
</tr>
</tbody>
</table>

* Priority Scale

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Priority Index

100...0

Source: Kirkpatrick and Bell, p. 24.
participating party. The result was a centralized marketing program which began operating during the 1987 season under the name Federation Produce Sales. All HPF cooperatives wishing to participate in the marketing program had to meet several criteria. The most restrictive of these criteria were that each cooperative was required to have fifty acres of product and provide a federal/state inspector at the time of packing (Horticultural Producers Federated Association, 1986). The HPF worked with several cooperatives requiring assistance to find financial assistance from their respective states to pay for the federal/state inspector. The HPF also provided FAX machines to participating cooperatives to facilitate transmission of orders and invoices.

Newsletter

The study instituted a monthly newsletter in the fall of 1986 to provide a structured communication link between the HPF cooperatives. This newsletter provided a forum through which innovative ideas were spread, announcements made, articles reprinted, and interviews with HPF member cooperatives circulated. The newsletter was successful and its distribution eventually covered over one hundred cooperatives, groups, government agencies, legislators, and other individuals interested in the HPF and its progress. However, as the study neared its conclusion, the frequency of the newsletter diminished to quarterly in 1988 and halted completely early in 1989. Unfortunately, to date none of the HPF cooperatives have been able to continue publication of this popular newsletter.

Potential HPF Services not Developed

There were several service areas which were researched but not developed through this study. These include tax management, management training, legal, and joint purchasing services. Although tax management was ranked sixth out of nine services when grouped with financial planning and accounting (Lively and Bell), informal feedback from the HPF cooperatives indicated that tax management was not a high priority. This lack of enthusiasm may
stem from the fact that many of the HPF cooperatives accrued little taxable income during normal operations.

Management assistance and training was dealt with through the ACS Cooperative Development Division "Management Training Workshops" offered twice a year and through direct interactions with ACS employees. Therefore, only limited management training has been offered through this study at the HPF annual meetings. The feasibility of offering a centralized legal office for HPF members was also investigated. This study concluded that the HPF cooperatives would benefit more from using their local legal services.

Joint purchasing was an attractive service offering to HPF members because their relatively small individual volumes precluded them from receiving volume discounts when purchasing packing containers. It was hoped that joint purchasing of supplies through the HPF would qualify them for quantity discounts offered by most container vendors. This study made an effort in the fall of 1985 to initiate coordinated joint purchasing of packing containers through the HPF. The cooperatives were surveyed and the results indicated they were interested in buying a total of 1,488,000 boxes of nine different types through the HPF (Table 9). Fifteen box companies including existing and potential HPF cooperative suppliers were initially contacted to see if they would be interested in submitting bids to the HPF. Of these fifteen companies, eight responded and three gave presentations to representatives of the cooperatives at the 1985 HPF annual meeting. After these presentations, however, the HPF board voted not to institute a formalized joint purchasing program until standardization of packing containers could be achieved by HPF members. Despite the lack of formal agreement, individual cooperatives were able to obtain significant discounts from their suppliers as a result of the negotiations and exposure to new sources of supply.

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43 The HPF cooperatives voted to standardize all their packing containers in a May 1990 board meeting.
Table 9. Interest of HPF Members in Joint Purchasing Determined by a September, 1985 Survey.

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of Boxes to be bought through the Federation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waxed vegetable boxes</td>
<td>665,400</td>
</tr>
<tr>
<td>Tomato boxes</td>
<td>481,000</td>
</tr>
<tr>
<td>Corn crates</td>
<td>127,000</td>
</tr>
<tr>
<td>Waxed broccoli boxes</td>
<td>123,500</td>
</tr>
<tr>
<td>Waxed cabbage boxes</td>
<td>46,600</td>
</tr>
<tr>
<td>Cabbage sacks</td>
<td>34,000</td>
</tr>
<tr>
<td>Other</td>
<td>10,500</td>
</tr>
</tbody>
</table>

Source: Kirkpatrick and Bell, p. 21.
Chapter Four: Evaluation of the HPF Services

Evaluation of Study Activities

The HPF services developed through this study were evaluated in several ways. Numerous informal comments from cooperative directors, managers, and members have been valuable in evaluating which services should be offered and determining how they should be developed, refined, and expanded. A formal advisory committee composed of cooperative leaders and representatives from ACS, AMS, the Extension Service, and TVA also provided the same type of feedback to this study. In addition to the above methods of guidance, this study also conducted written surveys of the member cooperatives at regular intervals to evaluate the HPF services. Most of these surveys focused on the record keeping program, how much it was being utilized, and what refinements or expansions were needed to make it more useful to the cooperatives. The emphasis on the record keeping program in these surveys is directly related to the large amount of effort expended to develop a useable accurate program for the cooperatives. The surveys did however, occasionally contain questions on the other HPF services. The last survey conducted by this study concentrated on determining the member cooperatives' satisfaction with the individual services being offered through the HPF and the HPF as a whole. The results of all these surveys which pertain to the members evaluation of HPF services and the HPF's impact on the member cooperatives will be reported in the next several sections.
Membership Evaluation of HPF Services

This study conducted surveys of the HPF membership at the end of the 1985, 1986, 1987, and 1988 marketing seasons. The 1985 survey was conducted by telephone and had a total of seven cooperatives responding. In 1986 the "HPF Computer Hardware And Software Evaluation Form" was mailed to the HPF member cooperatives and eleven cooperatives responded. The 1987 "VEGMARC II Evaluation" survey was conducted by telephone and had seven cooperatives responding. In 1988 the "1988 Horticultural Producers Federation Questionnaire" was mailed to all HPF cooperatives and the responses to the questionnaire were collected during follow-up telephone calls from thirteen cooperatives. This survey was the last conducted by this study and was designed to determine the member cooperatives' opinions on how effectively the HPF had served their cooperative during the last five years.

The information in these surveys is not strictly comparable among years because all HPF member cooperatives did not respond every year, the specific cooperatives which were members of the HPF each year changed, and because the questions were slightly different in various years. In addition to these variations, many of these surveys were trying to determine information about expansions and refinements in specific services in addition to the cooperatives' opinions on the effectiveness of that service. Therefore, only responses relating to the member cooperatives' evaluations of the HPF services will be described in this section. Copies of the complete 1985, 1986, 1987, and 1988 surveys can be found in Appendix A of this thesis.

Microcomputer Services

Record Keeping: Table 10 tabulates the responses of the cooperatives to survey questions relating to the VEGMARC II Record Keeping Program and its predecessors for the years 1985-1987. The responses of the cooperatives to the 1988 survey with respect to specific HPF services including VEGMARC II are displayed in Table 11.
Table 10. Responses to Survey Questions about VEGMARC Asked in 1985-87.

<table>
<thead>
<tr>
<th>Abbreviated Question</th>
<th>1985</th>
<th>1986</th>
<th>1987</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Number of Weeks Used</td>
<td>9.5</td>
<td>15.4</td>
<td>18</td>
</tr>
<tr>
<td>(sample size)</td>
<td>n = 7</td>
<td>n = 5</td>
<td>n = 5</td>
</tr>
<tr>
<td>Primary Record Keeping System</td>
<td>71% VEGMARC</td>
<td>71% VEGMARC</td>
<td>NA</td>
</tr>
<tr>
<td>(sample size)</td>
<td>29% Books</td>
<td>29% Books</td>
<td>NA</td>
</tr>
<tr>
<td>Accuracy of Program</td>
<td>100% Good</td>
<td>9.0 rating*</td>
<td>NA</td>
</tr>
<tr>
<td>(sample size)</td>
<td>n = 6</td>
<td>n = 6</td>
<td>NA</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>NA</td>
<td>9.2 rating*</td>
<td>NA</td>
</tr>
<tr>
<td>(sample size)</td>
<td>n = 7</td>
<td>n = 7</td>
<td>NA</td>
</tr>
<tr>
<td>Meet the Needs of Your Co-op</td>
<td>83% Yes</td>
<td>NA</td>
<td>80% Yes</td>
</tr>
<tr>
<td>(sample size)</td>
<td>17% No</td>
<td>NA</td>
<td>20% No</td>
</tr>
<tr>
<td>(sample size)</td>
<td>n = 6</td>
<td>n = 6</td>
<td>n = 5</td>
</tr>
<tr>
<td>Usefulness of Program</td>
<td>NA</td>
<td>9.2 rating*</td>
<td>NA</td>
</tr>
<tr>
<td>(sample size)</td>
<td>n = 7</td>
<td>n = 7</td>
<td>NA</td>
</tr>
<tr>
<td>Usefulness of the Manual</td>
<td>NA</td>
<td>10.0 rating*</td>
<td>8.0 rating*</td>
</tr>
<tr>
<td>(sample size)</td>
<td>n = 6</td>
<td>n = 6</td>
<td>n = 3</td>
</tr>
</tbody>
</table>

*On a scale of 1 to 10 with 1 representing not very good and 10 representing very good.

NA: Question not asked in that year.

Source: Kazmierczak and Taylor, p. 152.

<table>
<thead>
<tr>
<th>HPF Service</th>
<th>Average Response*</th>
<th>Response Range</th>
<th>% Cooperatives Participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spreadsheet Applications (n = 3)</td>
<td>9.3</td>
<td>10-8</td>
<td>23</td>
</tr>
<tr>
<td>VEGMARC II (n = 9)</td>
<td>8.9</td>
<td>10-8</td>
<td>69</td>
</tr>
<tr>
<td>Redwing Accounting Programs (n = 5)</td>
<td>8.8</td>
<td>10-6</td>
<td>38</td>
</tr>
<tr>
<td>Newsletter (n = 13)</td>
<td>8.6</td>
<td>10-6</td>
<td>100*</td>
</tr>
<tr>
<td>Educational Programs (n = 11)</td>
<td>8.4</td>
<td>10-6</td>
<td>100</td>
</tr>
<tr>
<td>Centralized Marketing (n = 6)</td>
<td>8.0</td>
<td>10-6</td>
<td>46</td>
</tr>
<tr>
<td>PRONET Market News (n = 8)</td>
<td>6.3</td>
<td>8-4</td>
<td>69</td>
</tr>
</tbody>
</table>

*Average response on a scale of 1 to 10 with 1 representing not satisfied and 10 representing very satisfied.

*All cooperatives automatically received the HPF Newsletter.

*The cooperatives were asked to rate only those educational programs conducted at the HPF's annual meeting.

Source: Kazmierczak, Bell, and Taylor, p. 4.
The average number of weeks the cooperatives used the VEGMARC II program increased from 9.5 weeks in 1985 to 18 weeks in 1987. The actual marketing season for most cooperatives involved in the survey was between eight and 16 weeks. Several factors accounted for the lower rate of use in the early years. In 1985, the record keeping program was not distributed in time for some cooperatives to use it during their entire marketing season. Exceptionally large staff turnovers also occurred in at least one of the cooperatives attempting to use the program. In addition, communication difficulties in 1985 and 1986 resulted in several of the cooperatives not utilizing the year-end report aspects of the program that extend the use of VEGMARC II beyond the marketing season. Of course, factors such as program design and resistance to change also affected the number of weeks some of the cooperatives used the program.

Seventy-one percent of the cooperatives responding to the survey in 1985 and 1986 and sixty-seven percent in 1988 used VEGMARC II as their primary record keeping system. Although these figures appear consistent between years, there was a substantial difference in the specific cooperatives responding to the surveys. Some of this variability was due to changes in the specific cooperatives choosing to use the program. These changes in some cooperatives’ decisions to use the program were primarily related to factors external to VEGMARC II that affected their operations, such as weather and poor management.

In 1985, the cooperatives were asked to rate in words the accuracy of VEGMARC II. One hundred percent of the responding cooperatives rated the program as good. In 1986, the cooperatives were asked to rate the accuracy of the program. This rating is reported here on a scale of one to ten, with one representing not very good and ten representing very good. On this scale the cooperatives assigned the program a 9.0 average rating. The 1986 survey also asked the cooperatives to rate the ease of use of the program. Using the same one to ten scale, the average rating assigned by the cooperatives was 9.2. The user friendliness of

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44 No comparable question was included on the 1988 final survey.
VEGMARC II had been a major concern since its inception, because diverse geographical locations of the cooperatives made it impractical for on-site help to be available to the cooperatives at all times. Moreover, the cooperatives had high employee turnover rates and their staffs generally had no previous computer experience. VEGMARCI II would not have been accepted without an emphasis on ease of use during its development.

In 1985 and 1987, the cooperatives using the program were asked whether the program met the needs of their cooperative. In 1985, 83% of the responding cooperatives said that the program did meet their needs, whereas 17% indicated that it did not. In 1987 these figures were 80% and 20%, respectively. In 1986 instead of asking a yes/no question, the cooperatives were asked to rate the usefulness of the program. Using a one to ten scale where one is not very useful and ten is very useful, the cooperatives rated VEGMARCI II a 9.2. In 1988 the cooperatives ranked their satisfaction with the VEGMARCI II program as 8.9 on the same one to ten scale used earlier. During each survey several cooperatives commented they would like to see minor modifications in the program to accommodate specific operating procedures of their cooperative.

**Market Information:** The 1988 survey indicated that although seventy-five percent of the cooperatives used PRONET market news system, they were on average somewhat less satisfied with the system as compared to the other services rating it a 6.3 on the one to ten scale (Table 11). Comments accompanying these ratings suggested that during the 1988 marketing season, PRONET did not update the market information as regularly as in previous years. As a result, the market information was at times one to two days old versus the minimum of twice daily updates promised by the company when the cooperatives subscribed. This change in PRONET’s service was potentially damaging to the cooperatives because of the volatility of the fresh vegetable market where large price swings can occur hourly. Under these circumstances, the cooperatives relatively low satisfaction rating of this service is understandable.
Financial Planning and Management: The 1988 survey indicated that twenty-three percent of all HPF cooperatives used the HPF sponsored spreadsheet application packages in their operations (Table 11). Although these cooperatives rated the application packages a 9.3 on the one to ten scale, the majority of the HPF members did not take the time to learn to use the packages and/or believed that using the spreadsheet would not enhance their business operations.

Accounting and Payroll: In the 1988 survey only thirty-three percent of the cooperatives indicated that they used one or more of the Redwing General Ledger, Payroll, Accounts Receivable, and Accounts Payable programs. These cooperatives, however, were more than satisfied with the service and rated it an 8.8 on the same one to ten scale (Table 11), perhaps as a result of their larger payroll and accounting requirements. Those cooperatives choosing to use the Redwing programs had on average, over five times as many members as cooperatives not choosing to use the program, 141 versus 24, respectively.

Other HPF Services

Educational and Technical Support: The 1988 survey indicated that one hundred percent of the cooperatives have sent at least one representative to the HPF annual meetings to participate in these programs and on average the cooperatives were more than satisfied with this service rating it an 8.4 on the same one to ten scale used earlier (Table 11). Some of the comments accompanying these ratings of the annual meetings included the importance of having the opportunity to talk with other cooperatives, the desire for more in depth presentations, and the desire for more time in which to discuss topics on the agenda.

The on-site and telephone support provided by this study to the cooperatives using the VEGMARC II program were only evaluated by the cooperatives in the 1986 survey. At this time the cooperatives indicated that they were more than satisfied with both the telephone and on-site support rating them a 9.0 and 9.4 on the previously used one to ten scale. However,
the cooperatives did indicate that they would have preferred more frequent on-site visits by rating the frequency of these visits a 7.0 on the same one to ten scale.

In addition to the workshops, meetings, telephone, and on-site support provided to the cooperatives, this study also provided written documentation for each version of the VEGRABC II program. On the 1986 and 1987 surveys the cooperatives rated the usefulness of the manual a 10.0 and 8.0 respectively on the same one to ten scale (Table 10). Despite this high rating the cooperatives often commented they would prefer to have on-site help over a written manual. It was felt, however, that the written documentation would become invaluable to the cooperatives at the close of the five year study and therefore considerable effort was expended to provide clear and effective written documentation of the VEGRABC II program.

Centralized Marketing: According to the 1988 survey, fifty percent of the cooperatives participated in the centralized marketing service and were generally pleased with the service rating it a 8.0 on the one to ten scale (Table 11). Despite the substantial participation centralized marketing had the second poorest overall satisfaction level of all the services examined in 1988. This discrepancy might be clarified by Bell’s statement that although centralized marketing is a service with the greatest potential to benefit the cooperatives, each cooperative has different ideas on how it should be implemented.

Newsletter: The relatively high level of member satisfaction with the newsletter indicated in the 1988 survey (Table 11), suggests that this communication device was useful to the cooperatives. The 8.6 rating on a one to ten scale was corroborated by accompanying comments which included “excellent”, “was helpful information”, and “a good medium to remain current with what is going on in the Federation.”

Chapter Four
Membership Evaluation of HPF Impact on Their Cooperative

The 1988 survey attempted to evaluate the member cooperatives’ feelings on how the HPF had impacted their cooperative. The cooperative responses to these questions are included in (Table 12). Perhaps one of the most visible impacts of the HPF on its membership has been the change in frequency of inter-cooperative communications. The cooperatives were asked whether their level of communication with other cooperatives had increased, stayed the same, or decreased since joining the HPF. Ninety-two percent of the cooperatives responded that they now communicated more often with other cooperatives, eight percent replied that there was no change in the amount of communication, and no cooperatives believed that there had been a decrease in their communications with other cooperatives. On average the cooperatives believed that this communication change had a positive effect on their cooperative rating this effect a 7.9 on a one to ten scale. In addition to the actual ratings collected, many of the cooperatives also made explanatory comments that included feelings of increased freedom to call other cooperatives, the benefit of inter-cooperative communication in ordering plants, and the sentiment that the more people a cooperative can talk to the more likely they are to find answers to their problems.

Cooperatives also ranked the frequency of inter-cooperative communication on eight specific subject areas (Table 13). Among the subjects included on the questionnaire, market prices ranked highest, production issues next, then cooperative grower participation, record keeping, computer operations, accounting, and tying for last was personnel management and financial planning. Three different subject areas were added by cooperatives in the two “Other” categories provided. Of these additions, product transportation was mentioned by four cooperatives and purchasing of supplies by two cooperatives, both receiving average rankings placing them between grower participation and record keeping. Lastly, one cooperative
Table 12. 1988 HPF Member Responses to Questions Concerning the Impact of the HPF on Their Cooperative.

<table>
<thead>
<tr>
<th>Question*</th>
<th>Average Response</th>
<th>Response Range</th>
<th>Number Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. HPF Fulfillment of Cooperative Expectations</td>
<td>7.4 †</td>
<td>10-2</td>
<td>13</td>
</tr>
<tr>
<td>2. Communication Level Change</td>
<td>85% Increased</td>
<td>N/A‡</td>
<td>13</td>
</tr>
<tr>
<td>15% No Change</td>
<td>0% Decreased</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Impact of Communication Change</td>
<td>7.9 ‡</td>
<td>10-6</td>
<td>13</td>
</tr>
<tr>
<td>4. HPF Influence on the Development of Your Cooperative</td>
<td>8.3 ‡</td>
<td>10-6</td>
<td>13</td>
</tr>
<tr>
<td>5. Cooperatives’ Financial Health</td>
<td>4.8 †</td>
<td>10-2</td>
<td>13</td>
</tr>
<tr>
<td>6. HPF’s Influence on Cooperative’s Financial Health</td>
<td>7.3 †</td>
<td>10-5</td>
<td>13</td>
</tr>
<tr>
<td>7. Cooperative’s Members Financial Health</td>
<td>6.0 †</td>
<td>8-2</td>
<td>12</td>
</tr>
<tr>
<td>8. HPF’s Influence on Cooperative’s Members Financial Health</td>
<td>7.0 †</td>
<td>10-5</td>
<td>13</td>
</tr>
</tbody>
</table>

*Question shown here in an abbreviated form.

†Average response on a scale of 1 to 10 with 1 representing did not meet expectations and 10 representing exceeded expectations.

‡N/A represents Not Applicable.

§Average response on a scale of 1 to 10 with 1 representing very negative influence and 10 representing very positive influence.

**Average response on a scale of 1 to 10 with 1 representing not healthy and 10 representing very healthy.

'Average response on a scale of 1 to 10 with 1 representing large negative effect and 10 representing large improvement.

Source: Kazmierczak, Bell, and Taylor, p.9.
mentioned packinghouse operations as the most frequently discussed subject in their inter-cooperative communications.

On average, the cooperatives considered the HPF to be a positive influence on the development of their cooperative by rating this influence 8.3 on a one to ten scale (Table 11). Although both positive and negative comments accompanied the ratings on this question, no cooperative felt that their participation in the HPF had hurt their cooperative. In fact, one comment from a cooperative marketing product for the first time in 1988 stated that, as a developing cooperative, they would not have been able to function without the marketing expertise and educational training supplied by the HPF. Other comments emphasized the value of the increased information available to the cooperatives as members of the HPF and the value of the HPF being able to facilitate the marketing efforts of cooperatives.

In addition to its overall influence on development, each cooperative was asked to rate how well the HPF had performed relative to their expectations upon joining the organization (Table 11). The average response of all cooperatives was a 7.4 on the same one to ten scale and suggests that the HPF has met their expectations, although again there were both positive and negative comments accompanying the ratings. In general, expectations of most cooperatives seemed to be in the area of marketing, although one cooperative stated that it joined the HPF for management help through computer programs. Specifically, expectations of larger volumes, extended marketing seasons, and prompt payment of sales invoices were mentioned most often by the cooperatives as reasons for joining the HPF.

In an effort to quantify the HPF’s impact on the financial status of member cooperatives, each cooperative was asked to rate its financial health and whether its participation in the HPF had improved or hindered that health. On average the cooperatives were unhappy with their financial health, rating it a 4.8 on a one to ten scale where one is not healthy and ten is very healthy (Table 11). Many of the comments accompanying these ratings alluded to three drought growing seasons in a row that had hurt both yields and grower participation. Dis-
Table 13. 1988 Cooperative Ratings of the HPF's Impact on Inter-Cooperative Communication in Specific Subject Areas.

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Response</th>
<th>Response Range</th>
<th>Number Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Prices</td>
<td>8.8*</td>
<td>10-6</td>
<td>11</td>
</tr>
<tr>
<td>Production</td>
<td>8.3</td>
<td>10-7</td>
<td>12</td>
</tr>
<tr>
<td>Grower Participation</td>
<td>7.9</td>
<td>10-4</td>
<td>11</td>
</tr>
<tr>
<td>Record Keeping</td>
<td>7.0</td>
<td>9-3</td>
<td>7</td>
</tr>
<tr>
<td>Computer Operations</td>
<td>6.5</td>
<td>9-5</td>
<td>4</td>
</tr>
<tr>
<td>Accounting</td>
<td>5.6</td>
<td>10-1</td>
<td>5</td>
</tr>
<tr>
<td>Personnel Management</td>
<td>4.5</td>
<td>7-2</td>
<td>4</td>
</tr>
<tr>
<td>Financial Planning</td>
<td>4.5</td>
<td>5-4</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>---</td>
<td>N/A*</td>
<td>7</td>
</tr>
</tbody>
</table>

*Average response on a scale of 1 to 10 with 1 representing least frequently discussed and 10 representing most frequently discussed. The cooperatives were allowed to add two additional subject areas to the eight listed on the survey.

*Three other subject areas were added by HPF member cooperatives and are discussed in the text.

*N/A represents Not Applicable.
couraged managers made comments like "not broke yet," "not healthy but paid our debts," and "debt service is a real problem." On average the cooperatives believed that their participation in the HPF had helped improve their financial health. However, those cooperatives participating in the HPF’s centralized marketing program believed that HPF had a more positive influence on their cooperatives’ health. These cooperatives rated their cooperative’s health as 6.4 and the HPF’s influence on this health as a 8.1 versus a 3.4 and 6.9 rating, respectively, for those not participating in the program.

To determine whether the HPF had impacted individual farmers the cooperatives were asked to rate the financial health of their members and the HPF’s influence on their member’s financial health. On average the cooperatives rated their members’ health as marginally healthy and the HPF’s influence on their members’ health as positive, a 6.0 and 7.0 respectively (Table 11). Once again, however, cooperatives participating in the HPF’s centralized marketing program, on average, rated each question higher. Those participating in centralized marketing rated their members health as 6.6 and the HPF’s influence on that health as a 8.1 versus a 4.8 and 6.3 rating, respectively, for those not participating in the program. Several cooperatives marketing through the HPF commented that the marketing program helped their cooperatives be more efficient and timely in paying their growers and had helped them get a better market price for their product.

**Membership Suggestions for Future HPF Services**

Table 14 displays the cooperatives’ suggestions for future HPF services. The most frequently mentioned suggestion was that the HPF should provide some sort of centralized production information, support the cooperatives’ production efforts by providing field staff, and establish crop demonstration plots. The second most often mentioned suggestion of promoting irrigation and establishing irrigation demonstration plots also indicates the cooperatives’ problems with production and production techniques. These suggestions plus two other production related suggestions, that the HPF offer scouting services and specific quality con-
trol standards, composed over half of the total responses for this question. Other suggestions for future services to be offered by the HPF included management training, joint purchasing of transplants, membership drives, information services on vegetable processing contracts, and the continued development of spreadsheet application packages.

**Discussion of HPF Services**

Many of the services developed by this study for the HPF were directed at helping the cooperatives overcome the failure of the perfect knowledge assumption discussed earlier in this thesis. All the microcomputer services, the newsletter, and most of the educational support services fall within this classification. Some of the education support services were also aimed at helping the cooperatives deal with the failure of the identical product assumption, by increasing their awareness of production and post harvest handling techniques. Both the coordination of sales and the centralized marketing services were developed to address the failure of the free market assumption and the efforts to establish a joint purchasing service were directed at the price taker assumption failure. A series of observations and evaluations from the perspective of this author will follow for each of the services developed for the HPF cooperative members. Possible solutions to any problems introduced in the following sections will be discussed in chapter five of this thesis.

**Microcomputer Services**

The decision to emphasize microcomputers made as a result of the Lively and Bell study has had both positive and negative results for the current study. By developing user-friendly software packages for use by the cooperatives in different service areas, the cooperatives had a number of tools with which they could collect or produce accurate information in a consistent format even when used by different employees. The procedures for calculating or obtaining information from the software packages were documented and remained at the cooperative regardless of the specific personnel employed by the cooperative at any one time.

<table>
<thead>
<tr>
<th>Service Suggestion</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. HPF should provide centralized production information, provide field staff, and establish demonstration plots.</td>
<td>3</td>
</tr>
<tr>
<td>2. HPF should promote irrigation and establish irrigation test plots.</td>
<td>2</td>
</tr>
<tr>
<td>3. HPF should provide insert and disease scouting services.</td>
<td>1</td>
</tr>
<tr>
<td>4. HPF should provide specific quality control standards.</td>
<td>1</td>
</tr>
<tr>
<td>5. HPF should provide management training.</td>
<td>1</td>
</tr>
<tr>
<td>6. HPF should coordinate plant purchases.</td>
<td>1</td>
</tr>
<tr>
<td>7. HPF should increase membership to provide more links to outlying cooperatives.</td>
<td>1</td>
</tr>
<tr>
<td>8. HPF should provide information on processing contracts.</td>
<td>1</td>
</tr>
<tr>
<td>9. HPF should continue to develop spreadsheet applications.</td>
<td>1</td>
</tr>
</tbody>
</table>
However, the extraordinarily high managerial and office staff turnovers for some HPF cooperatives seemed did result in several problems for this study. For example, one cooperative had a different manager each year for three years and in one eight to nine week season alone, had three different people employed in their one and only office position. Most of these managers and office employees had little if any previous microcomputer experience. While this may be an extreme case, the HPF cooperatives tended to have high employee turnovers between marketing seasons. As a result of such high turnovers, the study was forced to dedicate large amounts of time not only to the development of user-friendly software packages, but also to provide basic microcomputer and software assistance to inexperienced cooperative employees.

In addition to the lack of microcomputer experience among cooperative employees, the unrealistic expectations of the capabilities of the microcomputer were a problem. Many managers and office employees alike were under the misconception that the microcomputer would save them time entering information into their record keeping system, that the output of the software packages should conform to each cooperative's old way of doing things, and that one computer program should be able to perform all the functions and provide all the information required by the cooperative. The effects of these expectations and the cooperatives tendency not to explore the capabilities of the services developed by the project will be discussed as they pertain to each service individually.

**Record Keeping:** The two main problems encountered by this study in developing the VEGMARC II Record Keeping Program were the cooperatives employees' resistance to change as pertains to using a microcomputer and their unrealistic expectations mentioned above. The result was that many of the cooperatives displayed impatience with the record keeping service which utilized the microcomputer for data entry and report generation. Although one cooperative rejected VEGMARC II completely, most have incorporated some portions of the program into their operations. Some cooperatives were unhappy with the program because it did not keep their financial records, perform financial analysis, and make
financial projections, in addition to performing its stated purpose of maintaining their transaction records. Although commercial programs and application spreadsheets were located or written for specific cooperatives to accommodate these requests, some remained critical of VEGMARC II's "limited scope."

**Market Information:** Current market information seemed to be vital to the cooperatives at the beginning of this study. Most of the cooperatives had relatively low sales volumes, hired a broker to make these sales, and had no way to monitor the current market prices in order to evaluate the performance of their broker. Even though the early attempts to provide market information directly to the cooperatives were somewhat cumbersome and provided information which was one day old, the cooperatives were pleased with the initial efforts. As the procedures became more refined and the information more timely, the cooperatives were able to monitor their brokers and make better production quantity and timing decisions. Although some complained about the long distance telephone charges involved with the timesharing system of information dissemination, most agreed the information was well worth the cost.

**Financial Planning and Management:** The application spreadsheets developed by this project to help the cooperatives analyze their financial situation and deal with specific management problems were never fully utilized by most HPF cooperatives. Several cooperatives used the applications developed through this study as examples from which to develop packages customized specifically for their cooperative. These cooperatives however, employed personnel with enough computer experience to feel comfortable using an application that was not totally menu driven. In contrast, most of the cooperatives did not take the time to learn how to retrieve, input data, save, and calculate the basic SUPERCALC application files which were developed. In several instances cooperatives worked more closely with TVA than with VPI & SU and thus were encouraged to use LOTUS 1-2-3 instead of SUPERCALC. In these instances, this study converted the applications to 1-2-3 and distributed them to these cooperatives. The results were still disappointing. Despite repeated exposure to these application packages at the HPF annual meetings, the staff of most cooperatives seem unable to understand the ben-
efit of the computer's ability to quickly and accurately handle repetitive calculations and the potential of spreadsheets for analyzing numerous cooperative operating scenarios where only one or more variables change each time.

**Accounting and Payroll:** The larger cooperatives readily accepted the REDWING Payroll and to a lesser extent the REDWING Accounting programs. These cooperatives did however, experience problems primarily with the installation and setup of the program. This time however, they were dealing with a commercial program and had no chance of convincing REDWING to alter the existing program. As a result, most cooperatives took advantage of REDWING support contracts and assistance from a traveling computer assistant provided by TVA. A few cooperatives which bought the REDWING software were still unable to use it because of their inability to retain personnel experienced enough with microcomputers.

**Other HPF Services**

**Educational and Technical Support:** The educational workshops and tours conducted at the HPF's annual meetings and on other occasions were successful in several ways. First, they did expose the cooperatives to new ideas, alternative operating procedures, and better ways of doing things. Second, these various meetings promoted an atmosphere of cooperation among the cooperatives that definitely was not present at the beginning of the study. This last effect has had the most beneficial consequences for the cooperatives. Not only has it made it possible for them to jointly participate in activities such as centralized selling, it has also enabled them to receive much more government support through the HPF than would have been possible for them to receive individually. This government support from several different agencies has resulted in several government employees being assigned full-time or "majority-time" to work with the HPF as well as funding for several full-time positions employed by the HPF itself. This support also funded this study at VPI & SU which developed problem specific marketing and management services specifically for the HPF cooperatives.
This VPI & SU study also provided educational and technical on-site support for the cooperatives at the beginning of each marketing season followed up by unlimited telephone support. The on-site support was vital to train the mostly inexperienced employees of the cooperatives on how to utilize the capabilities of the microcomputer and application software. The large turnover rate of cooperative employees made the yearly visit and the unlimited telephone support even more essential. Continual development of new services, documentation of current microcomputer services, and funding limitations severely limited the number of on-site visits which could be made to each cooperative within a marketing season. An increased frequency of visits would have alleviated many of the microcomputer service problems discussed earlier and may have even increased the cooperatives' usage of the microcomputer in financial planning and analysis. Increased visits however, would not provide a total solution to the cooperatives' microcomputer problems. During the visits which did take place, employees would often still be responsible for various cooperative functions which prohibited them from focusing their entire attention on the microcomputer applications training.

**Coordination of Sales:** Although the HPF’s coordination of sales effort lasted only one marketing season, it served as a needed transition leading up to the HPF’s centralized marketing efforts. It introduced the cooperatives to the fact that they would have to pay a percentage of their receipts to participate in certain HPF programs. It also introduced the strongest form of cooperation among the cooperatives up to this time. The Marketing Analysis and Pricing Committee was made up of several cooperative managers and experienced many of the problems and complaints that were to be encountered when the HPF centralized marketing program began the next year. Some of these complaints were about the limitation of this committee to tomatoes and peppers when most cooperatives also marketed other commodities and about the limited input allowed from cooperatives whose managers were not a part of the committee.

**Centralized Marketing:** The HPF has had difficulty initiating its centralized marketing service. The sales agency of the HPF, Federation Produce Sales, has struggled with both volume and
quality problems from its inception in 1987. Marketing a limited number of crops, requiring minimum acreages of these crops, and providing extensive on-site production and packing training were only a few of the ways the HPF sought to protect itself from quantity and quality problems. Weather and disease factors, inexperience growing vegetables, and the lack of intensive management by the individual cooperative’s members have all contributed to the HPF’s problems with its centralized marketing service. The centralized marketing service has been successful in providing reasonable sales for the participating cooperatives and is generally viewed favorably by these cooperatives. The problem however, lies in the fact that the service is heavily subsidized through various grants and is not self sustaining at current sales levels. The large cuts in government spending in the late 1980’s going into 1990 are now a large concern to those agencies subsidizing the centralized marketing service. Without signs of movement toward self sufficiency, these agencies may elect to stop HPF funding in favor of other promising projects or be forced to do so by even larger budget cuts. If funding to the centralized marketing service is terminated, the HPF would be forced to charge much higher sales commissions, which would further decrease its already low sales volume.

**Newsletter:** The HPF Newsletter received positive comments from all groups involved. Perhaps the highest praise came from those agencies providing funding or developing services for the HPF and its member cooperatives. These agencies often found it difficult to maintain close contact with the HPF main office and the individual cooperatives. The newsletter served as a media to report HPF news and meetings, individual cooperative news, spotlight individual cooperative’s personnel and operating procedures, as well as discuss issues pertinent to the HPF.

**Discussion of HPF Impact on Cooperatives**

The HPF has impacted its member cooperatives in several ways. First, the communication level between the cooperatives has definitely increased and is viewed as a major success by the author. The cooperatives’ increased willingness to telephone other cooperatives for ad-
vice, learn from these cooperatives’ previous successes and failures, and to work on solutions to problems together was only a remote possibility when the HPF was organized in 1983. After the HPF’s formation under the urging of the ACS and the TVA, the cooperatives slowly began to see the advantages of inter-cooperative cooperation and the air of distrust and competitiveness began to diminish.

Secondly, the HPF has impacted its member cooperatives by making the development of a wide range of services for all the HPF’s members a reality. The development work done through this study and much of the support provided through other avenues would not have been possible without the HPF as a federated cooperative. The services developed have done much toward alleviating the market failure and intra-firm inefficiency factors predisposing the cooperatives to failure. Future challenges to the successful operation of HPF cooperatives will be discussed in chapter five of this thesis.
Chapter Five: Summary, Conclusions, and Implications for Future Cooperative Efforts

Thesis Summary

Chapter one describes the high failure rate of small-scale vegetable marketing cooperatives in the southeast. These failures can be attributed in part to the comparative disadvantage of the cooperatives located in these areas relative to the large producers located in California and Florida. The result of such a comparative disadvantage is not only a higher cost of production in the southeast but also substandard product in many cases. These cooperatives also encounter market level problems as a result of their inability to provide large enough volumes of quality product to oligopsonistic markets. Lastly, these small-scale southeastern cooperatives often experience internal efficiency problems relating to members’ production schedules, product quality, cooperative record keeping, accounting, payroll, and the lack of a strategic management plan.

The study reported in this thesis was directed at a federation of some of these cooperatives, the Horticultural Producers Federated Association (HPF), to improve the viability of its member cooperatives in several ways. The objectives of the study included promoting the flow of ideas between the HPF cooperatives, developing a comprehensive package of marketing and management services for the HPF cooperatives, measuring the cooperatives’ satisfaction with the services, determining the cooperatives’ perceptions of the HPF’s impact on their organization,
and helping the HPF become a self sustaining organization balancing the needs of all its membership.

Chapter two describes the cooperative form of business and how it differs from the more common investor-oriented firm (IOF). The most noteworthy difference being that a cooperative is a user-oriented firm where the patrons of the cooperative own and control the business as well as receive the monetary benefits accrued from cooperative operation. This chapter also provides an economic justification of cooperatives in a neoclassical economic framework. Specifically, the reasons for cooperative organization are explained in light of specific failures of the perfect market assumed as a starting point by neoclassical economics.

Chapter two then contrasts the decision making goals of IOF’s and marketing cooperatives in imperfect markets and their effects upon the welfare of society. It is demonstrated that both consumer and producer surplus are maximized when marketing cooperatives operate at cost. It is this observation which is one of the reasons behind the United States government’s support of agricultural cooperatives. Lastly, chapter two addresses in more detail, the issue of why cooperatives fail in the context of comparative disadvantage, market level failures, and inefficiencies existing within the firm. The potential of a federated cooperative to overcome some of these problems is also examined briefly.

Chapter three describes the initial 1983 survey in which the interest of ten cooperatives in nine potential HPF services was solicited. The subsequent development and implementation of many of these proposed services is discussed in detail. The nine potential services included:

1. current market information,
2. joint purchasing,
3. a newsletter to promote inter-cooperative communication,
4. packing house record keeping,
5. legal services,
6. financial planning, accounting, and tax management,
7. coordination of sales,
8. centralized marketing, and
9. managerial and technical assistance.

Microcomputer applications were developed or located to aid the individual cooperatives in obtaining: current market information, communication between cooperatives, packinghouse record keeping, financial planning, and accounting and payroll functions. Other services were developed which did not require the use of microcomputers by the member cooperatives and these included educational programs, marketing support, centralized marketing, and a newsletter.

Chapter four contains the cooperatives’ evaluation of the marketing and management services as determined through a series of surveys conducted in 1985, 1986, 1987, and 1988. On average the cooperatives were more than satisfied with all the HPF services. The cooperatives’ evaluation of the HPF’s impact on their cooperative and how well it had fulfilled their expectations was also positive. Particularly interesting were the cooperatives’ perceptions of the HPF’s impact on the financial health of their cooperative and their members. In both cases, those cooperatives participating in the HPF’s centralized marketing program believed that the HPF had a much greater positive impact on their organization and farmer members than those not participating in the program. Chapter four also includes a discussion of the successes, such as the newsletter, and the problems encountered, such as high staff turnovers, while developing the marketing and management services for the HPF.

**Benefits of Cooperation**

The high failure rate of small scale cooperatives that prompted this study has unfortunately fostered the common perception that cooperatives are weak and ineffectual. Despite this perception, the theoretical analysis and field work reported in this thesis has shown that co-
operation can benefit farmers in several ways. By taking joint action through a cooperative they are able to overcome many of the market failures which plague them as individual farmers. The cooperative can realize certain economies of size by spreading fixed costs across many growers, provide a guaranteed market at a reasonable price, and pool prices to help farmers overcome market failures in the price taker, identical product, free market, and perfect knowledge assumptions. Cooperatives choosing to operate at cost also provide the farmer with clear market signals as to the value of his/her product and allow the farmer to sell more product at a higher price than if he/she were marketing to an IOF enterprise. At times however, cooperation on more than a local level may be needed to overcome the market failures faced by the individual farmers. In these cases, a federated cooperative can realize economies of size by spreading the fixed costs of services across many growers, and provide more resources to address the intra-firm inefficiencies encountered by many cooperatives. The HPF was organized to perform these services for its member cooperatives.

The HPF as a Solution

The HPF has positively influenced its member cooperatives in several ways. First, it has reduced the atmosphere of competition and distrust between HPF members and as a result increased the flow of ideas between HPF members. Second, the HPF has served as a mechanism through which this study developed a package of services for HPF member cooperatives between the HPF’s organization in 1983 and this study’s conclusion in early 1989. This package includes a large group of microcomputer services addressing the record keeping, market information, financial planning and management, and accounting and payroll needs of the member cooperatives. Other services developed by this study for use by the HPF member cooperatives or developed as a result of the work done by this study include extensive educational and technical support, coordination of sales efforts, centralized marketing of member cooperative’s product, and the publication of the HPF Newsletter from late 1986 to early 1989. The cooperatives were satisfied with the services offered through the HPF and
believe that the organization has positively influenced the development of their cooperatives and improved the financial health of their member growers.

The multi-agency multi-year effort to develop these services for a federated cooperative may have applications to other cooperatives today. As communication links between various cooperatives become more established the possibility for federated cooperatives will also increase. By fostering this federated approach to the problems of small-scale cooperatives, these cooperatives can gain funding and expertise to tackle previously insurmountable problems. In addition, some of the services developed through these federated efforts may be applicable to individual cooperatives which are not members of the federated cooperative for which the service was developed. One such example is the VEGMARC II Record Keeping Program which has been considered for use by flower, herb, and vegetable marketing cooperatives in Arkansas, Hawaii, Mississippi, Oklahoma, and Wisconsin, as well as in Israel. The Agricultural Cooperative Development International (ACDI) is also currently considering using VEGMARC II as part of their program to aid cooperatives in several South American countries.

**Suggested Expansions of HPF Services**

The HPF has not solved all the operational and marketing problems of its member cooperatives and member cooperatives do still fail. Under utilization of HPF services or not recognizing and acting upon warning signals when they are exposed by these services are a contributing factor to these failures. The following sections describe several new HPF services which could strengthen the present offerings of the HPF and may help move the HPF toward autonomy from government funding.

**Centralized Microcomputer Services**

The discussion of the HPF microcomputer services in chapter four mentioned several problems related to the high staff turnover rates and the lack of microcomputer experience among cooperative managers and office staff. More frequent on-site visits have already been alluded
to as a solution to these problems in the preceding discussion of the educational and technical support provided to the cooperatives also found in chapter four. These visits would have helped alleviate many of the "perceived" problems more quickly and reduced many of the psychological barriers to using the microcomputer and specific software packages. More frequent on-site help may even have increased the usage of the microcomputer in financial planning and analysis. However, frequent on-site visits are prohibitively expensive and a more complete solution to the staff turnover/microcomputer inexperience problem could be to provide some sort of centralized microcomputer support through the HPF.

Although centralized microcomputer support was considered after this studies' conclusion in early 1989, no comprehensive computer support has been available to the cooperatives since that time. A centralized microcomputer support service could provide more frequent on-site help to individual cooperatives; regain the level of unlimited telephone support provided in the past by this study; and offer data entry, retrieval, and analysis services to cooperatives. The data entry, retrieval, and analysis services would use the same software packages currently sponsored through existing HPF microcomputer services. The difference would be that each cooperative would have the option to subscribe on a program by program basis to the centralized service and not have to train cooperative personnel in some or all of these computer applications. The record keeping and financial analysis functions of fledgling cooperatives could benefit tremendously from such a service. A centralized record keeping service could quickly obtain their weekly transaction data on standardized forms through FAX machines which most of the cooperatives already own. Consistent daily and pool period reports would be FAXed back to the cooperatives for them to write checks to their grower members or the service could express mail them the preprinted checks requiring only the signature of a cooperative official. A centralized financial analysis service would take standardized data provided by each subscribing cooperative and produce consistent financial statements accompanied by explanations of how to use the resulting information. This service would
strive to encourage cooperatives to take advantage of the computers ability to analyze numerous cooperative operating scenarios where only one or two variables change each time.

These centralized microcomputer support services should be made self supporting through subscription fees, but in reality would probably be partially subsidized by government grants. Cooperatives should have the option to subscribe at different levels depending upon the microcomputer experience of their manager and office staff. Emerging cooperatives should be encouraged by the government agency performing their feasibility study to subscribe to the centralized record keeping and financial analysis services for at least their first two marketing seasons. The transaction and financial information related problems of emerging cooperatives may be some of the most important factors contributing to the quick failure of these groups.

Public Relations and Promotion Service

Two additional problems were alluded to in the discussion of HPF services in Chapter four of this thesis. These were the lack of enough quality product to make the HPF centralized marketing efforts self sustaining and the discontinuance of the HPF Newsletter upon the termination of this study. Both of these problems could be solved by the institution of a public relations and promotion service by the HPF. This new service would seek out new cooperatives to join the HPF and publish a newsletter to keep its expanding membership and supporting agencies informed of HPF activities and pertinent facts. By exposing the HPF to new groups through a regular newsletter, these groups would see the benefits to their cooperatives of joining the HPF. In turn the new members would be able to provide a larger base of resources from which to provide self sustaining HPF services. Specifically, increased membership would increase the volume marketed through the HPF's centralized marketing program and provide a larger number of cooperatives across which the fixed costs of a centralized microcomputer service could be allocated. In addition to providing increased sales volume, increased membership could expand the HPF marketing season and in turn their
market share. The structure which has been developed to support the current HPF membership is under utilized and would be more cost effective if it served a larger clientele.

**Future Challenges for the HPF and Other Cooperative Efforts**

The HPF has addressed many of the market failure and intra-firm inefficiency problems facing its member cooperatives. However, a few intra-firm inefficiency and comparative disadvantage problems remain. A short discussion of each of these challenges to current and future cooperative efforts is provided below.

**The Intra-Firm Inefficiency Challenge**

A large portion of the intra-firm inefficiency problems of cooperatives may be illustrated by the "we versus they" attitude encountered in many cooperatives. This attitude comes in many different forms: the manager versus the members, the manager versus the board of directors, the board of directors versus the members, and the manager and office staff versus the packinghouse labor. These attitudes display a basic misunderstanding in many cooperatives about who owns the cooperative and what type of goals it should pursue. The theories of X-efficiency, the cooperative as a nexus of contracts, and the cooperative as a coalition all address the intra-firm inefficiencies resulting from the "we versus they" syndrome. All of these theories address the fact that there is no "peak coordinator" in cooperative organizations and that intra-firm decisions are made as a result of informal bargaining between "competing" cooperative participants.

In addition, Leibenstein’s theory of X-efficiency also helps explain both the intra-firm inefficiencies resulting from quality differences between cooperative employees holding the same type of position and the cooperatives’ tendencies to depend heavily on government funding. In the first case this theory makes the assumptions that employers do not completely specify job requirements when hiring employees and that all factors of production including the true
capabilities of a manager are not effectively rewarded with their true value through normal markets. In the second instance, the assumption that a cooperative as the employer does not control the effort decisions of its employees has a different implication. In Leibenstein's words (1979, p. 19) "as prices rise there is likely to be a tendency towards rising costs at the same time" and "X-efficiency theory sees costs as a spring which rises unless enough external pressure' is put on the effort choices of firm members." In the same way that grower members of each cooperative may view their patronage refund as part of the market price resulting in improper production decisions, the cooperative employees may view monies received through government grants as business profits to be spent on marginal choices.

The cooperative as a nexus of contracts theory helps explain another aspect of intra-firm inefficiencies within cooperatives. According to this theory cooperative members must incur the costs necessary to monitor the other cooperative participants in order to maximize their welfare as owners of the cooperative and the members or their elected representatives, the board of directors, must maintain control of all policy setting decisions and monitoring aspects of the cooperative. All management decisions made based on these policies should rest with the members hired representative, the manager. In reality, this ideal is rarely practiced in small-scale vegetable marketing cooperatives. Either the cooperative members and their board of directors will not take responsibility for setting policies which guide the management or else they adopt policies which are intrusive on the every day decision making of the manager such as when a director must sign every cooperative check and approve every cooperative purchase no matter how small.

Training for cooperative members, boards of directors, and managers is needed to educate each participant on cooperatives, their purpose, and how they should establish policies and make operating decisions. Board of directors training has been conducted in the past on a regional basis by the ACS each year. Proposals are currently being considered to make this training available to each cooperative in their own town. If this localized training is instituted it should be broad enough to provide education not only to the cooperative's board of directors.
but also to each grower member of that cooperative and its management staff. The training should be provided to each cooperative at least every two years and incentives for attendance should be devised for all cooperative participants.

The Comparative Disadvantage Challenge

As the 1988 survey illustrated, consistent quality production remains a major problem for the HPF cooperative members. As a result, the HPF members are at a comparative disadvantage to firms based in large vegetable producing areas such as California, Florida, and Texas for several reasons. The HPF cooperatives consist of more than eighty percent part-time farmers who lack the resources and the expertise to provide the intensive management practices required to produce consistent high quality vegetables. The remaining full-time farmers sometimes grow vegetables “part-time” in order to diversify their more traditional farming operations. This type of farmer is often unwilling to allocate adequate resources to the vegetable enterprise and many times is lacking in knowledge of vegetable production practices.

Although quality vegetables can be produced in the geographical locations of the HPF cooperatives, it may not be economical to do so. Quality vegetables cannot be produced without irrigation to counteract inconsistent rainfall, intensive scouting for pest and disease damage, detailed attention to the timing and degree of cultivation practices, and a strong commitment to the vegetable enterprise. Until these resource needs are addressed, the grower members of the HPF cooperatives will not be able to fully take advantage of the possibilities for financial gain offered by their respective cooperatives. Instead the problems of under production and poor quality will continue to plague both the individual cooperatives and the HPF’s centralized marketing service.
References


Horticultural Producers Federated Association. HPF board meeting minutes, November 13, 1986.

Kazmierczak, T.K., J.B. Bell, and D.B. Taylor. *An Evaluation of a Federation of Small-Scale Vegetable Marketing Cooperatives.* Virginia Polytechnic Institute and State University, Department of Agricultural Economics SP 89-25, July 1989, 12 pgs.


Appendix A: Survey Forms

The following survey forms were used over the five year duration of the study to solicit information on software programs and HPF services from the HPF member cooperatives. The 1985 survey, Operator's Opinion of the VEGMARC Recordkeeping Program, was conducted over the telephone. The 1986 HPF Computer Hardware And Software Evaluation Form was conducted as a mail survey. Answers to the 1987 VEGMARC II Evaluation questionnaire were collected over the telephone. Although, the 1988 Horticultural Producers Federation Questionnaire was mailed to the HPF member cooperatives and all answers were collected over the telephone.
Operator's Opinion of the VEGMARC Recordkeeping Program
1985

Cooperative Name:
Computer Operator:
Manager:

Number of weeks used program:

Primary recordkeeping system:
Secondary recordkeeping system:

Accuracy of calculations:

Would being able to hold questionable transactions out of a pool period during calculation and
posting be helpful with bad produce?

Was posting to the YEARLY DATA DISK a problem and if so why?

Would being able to change data once it had been posted to the YEARLY DATA DISK make
you more confident in the program?

Did the program meet the needs of your cooperative?

Other:
HPF Computer Hardware And Software Evaluation Form

November 1986

Cooperative

Computer Operator

Manager

Hardware Evaluation

1) What kind of computer do you use? (check one)
   □ IBM PC
   □ IBM XT
   □ None
   □ IBM AT
   □ Other

2) How much internal memory do have in this computer? (check one)
   □ 256K
   □ 512K
   □ 640K
   □ Other

3) What kind of printer do you use? (check one)
   □ IBM Graphics
   □ Radio Shack #____
   □ Epson#____
   □ Other
   □ None

4) What type of modem do you use? (check one)
   □ Hayes Smartmodem
   □ None
   □ Other

5) Do you have a hard disk? (check one)
   □ Yes: Size in megabytes
   □ No

6) Does this equipment meet your needs? (check one)
   □ Yes
   □ No

7) What additional equipment do you need? (check one)
   □ Hard disk
   □ Printer
   □ 640K memory
   □ Modem
   □ Other

8) Why do you feel you need this equipment? _______________________________

______________________________
______________________________
______________________________

Appendix A 113
## General Software Evaluation

What programs do you use? (check all that apply)

- □ VEGMARCI
- □ SUPERCALC
- □ LOTUS
- □ DBASE
- □ PC-FILE
- □ WORDSTAR
- □ CROSTALK
- □ PRONET
- □ Other

<table>
<thead>
<tr>
<th>1) How many weeks did you use the program? (fill in blank)</th>
<th>VEGMARCI</th>
<th>SUPERCALC</th>
<th>RED WING</th>
<th>PRONET</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>___ weeks</td>
<td>___ weeks</td>
<td>___ weeks</td>
<td>___ weeks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2) How easy was the program to use? (circle one)</th>
<th>1 2 3 4 5 NA</th>
<th>1 2 3 4 5 NA</th>
<th>1 2 3 4 5 NA</th>
<th>1 2 3 4 5 NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Very...Very</td>
<td>Not Very...Very</td>
<td>Not Very...Very</td>
<td>Not Very...Very</td>
<td>Not Very...Very</td>
</tr>
</tbody>
</table>

| 3) How accurate was the program? (circle one) | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA |

| 4) How fast was the program? (circle one) | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA |

| 5) How useful was the program overall? (circle one) | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA |

| 6) How useful was the manual overall? (circle one) | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA |

| 7) How effective was the company support? (circle one) | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA |

| 8) How effective was the project's telephone support? (circle one) | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA |

| 9) How effective was the project's on-site support? (circle one) | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA |

| 10) How adequate was the frequency of on-site project support? (circle one) | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA |

| 11) Overall effectiveness of project support? (circle one) | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA | 1 2 3 4 5 NA |

Other comments regarding the four programs evaluated in depth and any other software packages you may use would be greatly appreciated.
VEGMARC Software Evaluation

1) How was VEGMAR C used in your cooperative? (check one)
   □ Primary record keeping system
   □ Secondary record keeping system
   □ Other: Explain

2) Did the program handle enough crops? (check one)
   □ Yes □ No

3) Did the program handle enough packing fees? (check one)
   □ Yes □ No

4) Do you need to be able to deduct one-time fees not on a per box basis? (check one)
   □ Yes □ No
   Explain

5) Would you like to charge for culls and have it show up on the pool period reports? (check one)
   □ Yes □ No
   Explain

6) Did you use the mailing label option in VEGMAR C? (check one)
   □ Yes □ No
   Explain

7) Was the editing procedure for grower and buyer transactions adequate? (check one)
   □ Yes □ No
   Explain

8) Were you able to use the pool period calculations in any way? (check one)
   □ Yes □ No
   Explain

9) Were you able to use the pool period calculations and packing fees to arrive at a grower’s net? (check one)
   □ Yes □ No

10) Did you use the hold procedure to hold questionable transactions out of the pool period? (check one)
    □ Yes □ No
    Explain

11) Were there any unforeseen questionable transactions which had to be posted twice? (check one)
    □ Yes □ No
    Explain

12) Did you use the check writing portion of the program? (check one)
    □ Yes □ No
13) If you did not use the check writing program, why not? (check one) □ Had too many pre-printed checks
□ Needed more memo area on stub
□ Used another program
□ Did not have time to learn to use
□ Other

14) Did you use the End-Of-Year reports portion of the program? (check one) □ Yes □ No

15) If you did not use the End-Of-Year reports program, why not? (check one) □ Did not know there was one
□ Did not have written instructions
□ Preferred to do by hand
□ Other

16) Is there any additional information which needs to be stored by VEGMARc?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

17) What would you like to see changed about VEGMARc?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
VEGMARCC II Evaluation
December 1987

Cooperative: ________________________________

Computer Operator: __________________________

1. How many weeks did your cooperative use VEGMARC II?  
   _________ weeks  Comments: __________________________

   IF YOUR COOPERATIVE DID NOT USE VEGMARC II AT ALL  
   PLEASE SKIP TO QUESTIONS 5 THROUGH 11.

2. How useful was VEGMARC II overall? (circle one)  
   very  1  2  3  4  5  NA  Comments: __________________________
   not very

3. How useful was the VEGMARC II user's manual overall?  
   (circle one)  very  1  2  3  4  5  NA  Comments: __________________________
   not very

4. Complete the following chart to show which operations in VEGMARC II your cooperative used during 1987.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Circle One</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Grower/Buyer Information</td>
<td></td>
</tr>
<tr>
<td>Retrieval</td>
<td></td>
</tr>
<tr>
<td>a. Mailing Labels/Directories</td>
<td>Yes</td>
</tr>
<tr>
<td>b. Dues List</td>
<td>Yes</td>
</tr>
<tr>
<td>II. Calculation Aids</td>
<td></td>
</tr>
<tr>
<td>a. Packing Fees/Retained Capital</td>
<td>Yes</td>
</tr>
<tr>
<td>b. One-time Fee Options (Fee, Bulk, and Cull)</td>
<td>Yes</td>
</tr>
<tr>
<td>c. Hold Transaction from Pool</td>
<td>Yes</td>
</tr>
<tr>
<td>Option</td>
<td>Yes</td>
</tr>
<tr>
<td>d. Pool Price Calculations</td>
<td>Yes</td>
</tr>
<tr>
<td>e. Editing Official Pool Price</td>
<td>Yes</td>
</tr>
<tr>
<td>f. Calculating Grower Returns</td>
<td>Yes</td>
</tr>
<tr>
<td>g. Posting Procedure</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### III. Transaction Information Retrieval

<table>
<thead>
<tr>
<th>Operation</th>
<th>Circle One</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Daily Reports</td>
<td></td>
</tr>
<tr>
<td>Grower</td>
<td>Yes</td>
</tr>
<tr>
<td>Buyer</td>
<td>Yes</td>
</tr>
<tr>
<td>Packout</td>
<td>Yes</td>
</tr>
<tr>
<td>Loadout</td>
<td>Yes</td>
</tr>
<tr>
<td>b. Pool Period Reports</td>
<td></td>
</tr>
<tr>
<td>Grower</td>
<td>Yes</td>
</tr>
<tr>
<td>Buyer</td>
<td>Yes</td>
</tr>
<tr>
<td>Packout</td>
<td>Yes</td>
</tr>
<tr>
<td>Loadout</td>
<td>Yes</td>
</tr>
<tr>
<td>c. Year-To-Date Reports</td>
<td></td>
</tr>
<tr>
<td>Grower</td>
<td>Yes</td>
</tr>
<tr>
<td>Buyer</td>
<td>Yes</td>
</tr>
<tr>
<td>Packout</td>
<td>Yes</td>
</tr>
<tr>
<td>Loadout</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### IV. Check Writing Aids

<table>
<thead>
<tr>
<th>Operation</th>
<th>Circle One</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Check Writing Procedure</td>
<td>Yes</td>
</tr>
<tr>
<td>b. Check Book Balancing Procedure</td>
<td>Yes</td>
</tr>
<tr>
<td>c. Check and Deposit Reports</td>
<td>Yes</td>
</tr>
</tbody>
</table>

5. Did VEGMARC II handle enough crops for your cooperative? (circle one) Yes No Comments: __________

6. Did VEGMARC II handle enough packing fees for your cooperative? (circle one) Yes No Comments: _______________

7. Did VEGMARC II perform the record keeping tasks needed by your cooperative? (circle one) Yes No Comments: _______________

8. Did VEGMARC II produce the reports needed by your cooperative? (circle one) Yes No Comments: _______________

9. Did VEGMARC II meet the needs of your cooperative? (circle one) Yes No Comments: _______________
10. If your cooperative did not use VEGMARC II explain why not. (check appropriate responses)
   __ Got fed up with previous versions
   __ Did not have access to a microcomputer
   __ Did not have enough time to learn the program
   __ Did not have enough volume to warrant its use
   __ It did not meet the needs of our cooperative
   __ Preferred to keep records by hand
   Other: __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________

11. Was VEGMARC II your primary or secondary record keeping system? (circle one) Primary Secondary
   Comments: ______________________________________
   ______________________________________
   ______________________________________
   ______________________________________

12. How accurate was the program? (circle one)
   very not very
   1  2  3  4  5  NA Comments: ___________
   ______________________________________

13. How easy was VEGMARC II to use? (circle one)
   very not very
   1  2  3  4  5  NA Comments: ___________
   ______________________________________
1988 Horticultural Producers Federation Questionnaire

Cooperative Name: ________________________________

Your Name: ________________________________

Your Position: ________________________________

Date: ________________________________

Part One: The following questions concern the services offered through the HPF to its member cooperatives. Your cooperation in answering these questions is greatly appreciated.

1. Overall, has the HPF and the services it offers been a positive or negative influence in the development of your cooperative? (Please rate the HPF's influence by circling a number on a scale of 1 to 8, with 1 representing very positive and 8 representing very negative. Explain your answer.)

   1......2......3......4......5......6......7......8

   Explain:

2. Overall, has the HPF met the expectations you had for it when you joined? (Please rate how well your expectations have been met by circling a number on a scale of 1 to 5, with 1 representing exceeded expectations and 5 representing did not meet expectations and explain your answer.)

   1......2......3......4......5

   Explain your expectations and how the HPF has met or not met them:
3. In which of the following services offered by the HPF does your cooperative participate? (Check the appropriate box under each service and explain your cooperative’s decision.)

- Centralized Marketing
  □ Participate
  □ Not Participate
  Please explain the decision:

- VEGMARC II Record Keeping Program
  □ Participate
  □ Not Participate
  Please explain the decision:

- ProNet Market News System
  □ Participate
  □ Not Participate
  Please explain the decision:

- Educational Programs at Annual Meeting
  □ Participate
  □ Not Participate
  Please explain the decision:

- Redwing Accounting and/or Payroll Programs
  □ Participate
  □ Not Participate
  Please explain the decision:

- Lotus and/or SuperCalc Spreadsheet Applications
  □ Participate
  □ Not Participate
  Please explain the decision:
4. What is your cooperative’s level of satisfaction with the HPF services in which you participate? (Please rate these services by circling a number on a scale of 1 to 5, with 1 representing very satisfied and 5 representing not satisfied and give a brief explanation for each rating.)

1...2...3...4...5 Redwing Accounting and/or Payroll Programs
Explain:

1...2...3...4...5 Lotus and/or SuperCalc Spreadsheet Applications
Explain:

1...2...3...4...5 Newsletter
Explain:

1...2...3...4...5 Centralized Marketing
Explain:

1...2...3...4...5 VEGMARC II Record Keeping Program
Explain:

1...2...3...4...5 ProNet Market News System
Explain:

1...2...3...4...5 Educational Programs at Annual Meeting
Explain:

Additional Comments:
5. How valuable do you consider each of the services offered by the HPF, regardless of whether your cooperative can actually participate in the service? Please rate these services by circling a number on a scale of 1 to 5, with 1 representing very valuable and 5 representing not valuable and give a brief explanation of your rating.

1...2...3...4...5 ProNet Market News System
Explain:

1...2...3...4...5 Educational Programs at Annual Meeting
Explain:

1...2...3...4...5 Newsletter
Explain:

1...2...3...4...5 Redwing Accounting and/or Payroll Programs
Explain:

1...2...3...4...5 VEGMARC II Record Keeping Program
Explain:

1...2...3...4...5 Centralized Marketing
Explain:

1...2...3...4...5 Lotus and/or SuperCalc Spreadsheet Applications
Explain:

Additional Comments:
6. How has your cooperative’s level of communication with other cooperatives changed since joining the HPF? (Check one box only and explain your answer.)

☐ Communication level has increased
☐ No change in communication level
☐ Communication level has decreased
Explain your answer:

7. How would you rate the impact of this communication change on your cooperative? (Please rate the impact by circling a number on a scale of 1 to 8, with 1 representing very positive impact and 8 representing very negative impact. Explain your answer.)

1......2......3......4......5......6......7......8

Explain:
8. In your communication with other cooperatives, which of the following subject areas are most often discussed? (Rank the subject areas from 1 (most frequently discussed) to 10 (least frequently discussed) and explain your answer.)

___ Market Prices
Explain:

___ Personnel Management
Explain:

___ Record Keeping
Explain:

___ Accounting and/or Payroll
Explain:

___ Financial Planning
Explain:

___ Grower Participation
Explain:

___ Production
Explain:

___ Computer Operations
Explain:

___ Other: _____________________
Explain:

___ Other: _____________________
Explain:

Additional Comments:
9. Does your cooperative have suggestions for additional services the HPF might offer to its members in the future? Please write these suggestions in the following space.
Part Two: The following questions concern background information on your cooperative. Once again your cooperation is greatly appreciated.

1. How many years has your cooperative been in operation, what year did you join the HPF, and how many members did you have in 1988?
   
   ___ Years
   ___ Year joined HPF
   ___ Members in 1988

2. How would you rate the financial health of your cooperative on a scale of 1 to 5 with 1 representing very healthy and 5 representing not healthy?
   
   1......2......3......4......5
   
   Explain your answer:

3. Has your cooperative’s participation in the HPF improved your cooperative’s financial health? (Please answer by circling a number on a scale of 1 to 8, with 1 representing large improvement and 8 representing large negative effect. Explain your answer.)
   
   1......2......3......4......5......6......7......8
   
   Explain your answer:

4. How would you rate the financial health of your cooperative’s grower members on a scale of 1 to 5 with 1 representing very healthy and 5 representing not healthy?
   
   1......2......3......4......5
   
   Explain:

5. Overall, would you say that your cooperative’s participation in the HPF has improved the financial health of your cooperative’s grower members? (Please answer by circling a number on a scale of 1 to 8, with 1 representing large improvement and 8 representing large negative effect. Explain your answer.)
   
   1......2......3......4......5......6......7......8
   
   Explain your answer:
Part Three: The following section concerns the receptiveness of various organizations to suggestions of your cooperative for change. Please be completely frank in your answers. The answers will be used solely for self examination and will in no way detract from future help received from these agencies.

1. How receptive does your cooperative feel that the following organizations were to your suggestions of change in HPF sponsored programs and activities. (Rate the organizations receptiveness by circling a number on a scale of 1 to 5, with 1 being very receptive and 5 being not receptive.)

1...2...3...4...5 Horticultural Producers Federation
Explain:

1...2...3...4...5 Agricultural Cooperative Service
Explain:

1...2...3...4...5 Tennessee Valley Service
Explain:

1...2...3...4...5 Agricultural Marketing Service
Explain:

1...2...3...4...5 Virginia Tech
Explain:

Additional Comments:
Vita

Tamra Kirkpatrick Kazmierczak was born Tamra Jane Kirkpatrick on April 6, 1962 in Madison, Wisconsin. Four years later her family moved to Blacksburg, Virginia. She graduated eighth in her class from Blacksburg High School in June 1979 and entered Virginia Polytechnic Institute and State University (VPI & SU) in Horticulture. She graduated 128th in the entire university with her bachelor of science degree in June 1983. After one and half years of working various jobs she began working for Dr. Jim Bell in the Department of Agricultural Economics at VPI & SU on a grant to develop services for a federation of vegetable marketing cooperatives in March 1985. In September 1985 she began taking classes part-time in pursuance of her master of science degree. She continued to work full-time on various grants developing computer software to determine the feasibility of new vegetable marketing cooperatives and gathering information on direct marketing lamb's to the public as well on the possibilities for cooperative marketing of lambs. She completed the requirements for her master of science degree in September 1990 and will complete two publications on lamb marketing before September 1991.


Tamra Kirkpatrick Kazmierczak