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**COOPERATIVE DEVELOPMENT AND FUNCTIONS
IN SPECIALTY CROP INDUSTRIES**

**with Case Studies of the U.S. Tart Cherry
and Farm-Raised Catfish Industries**

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Agricultural cooperatives continue to provide farmers with a means of joining together to solve their own problems. An increase in cooperative activity has occurred in specialty crop industries because producers in these industries often face unfavorable market conditions. Future cooperative development and functions in specialty crop industries are assessed through two methods. One guide of future cooperative development in an industry involves identifying market failures in the industry and their negative consequences that may lead to cooperative development. Examination of case studies of cooperative development and functions in other, similar specialty crop industries serves as a second guide.

*Authors are Research Assistant and Assistant Professor, Cornell University, respectively. The authors appreciate helpful comments from Professors Bruce Anderson and Ralph Christy. The authors are solely responsible for the views expressed here and for any remaining errors.

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INTRODUCTION

Agricultural cooperation has occurred since the origin of farming. In 1922, the Capper-Volstead Act legally sanctioned agricultural cooperatives in the United States. Agricultural cooperatives are organizations formed and comprised of farmer-members. The activities of agricultural cooperatives "are conducted on a cost of doing business basis and are developed to increase farm income by improving the market for farm products and reducing the cost of farm supplies and related services" (Bogard, speech). Since agricultural cooperatives were first organized, their basic purpose has been to give groups of farmers an opportunity to serve their own needs and solve their own problems more effectively than they could acting individually (How, p.13).

Through the application of economic theory, this paper analyzes the development and functions of cooperatives in specialty crop industries. Issues discussed include: why cooperatives form; the different kinds of cooperatives; the benefits and limitations of agricultural cooperation; the keys to a successful agricultural cooperative; and current and future issues that will influence the growth of cooperatives in agricultural industries.

This discussion focuses on the formation and development of agricultural cooperatives in specialty crop industries because, due to the relatively small size of these industries and the often highly perishable nature of their crop, specialty crop producers frequently face difficult market conditions. Adverse circumstances such as extremely low product prices or insufficient market outlets often prompt the development of cooperatives in these industries.

This paper addresses issues relating to specialty crops in general and applies them specifically to two specialty crop industries, the tart cherry industry and the farm-raised catfish industry. The formation and functions of cooperatives in these two agricultural industries are presented. Different cooperatives in the tart cherry and farm-raised catfish industries then are described and their benefits, limitations, and success rates are discussed. These two specialty crops represent industries at different stages of growth; the

tart cherry industry is a well-established, mature market, while the catfish industry is relatively new--it's initial growth having only recently slowed down. This discussion of cooperatives in specialty crop industries and the case studies of the tart cherry and farm-raised catfish industries should assist participants in other specialty crop industries at every stage of growth to understand the development and roles of cooperatives in their industry.

COOPERATIVE DEVELOPMENT AND FUNCTIONS

REASONS FOR COOPERATIVE FORMATION

Agricultural Market Failures

A popular saying states that "cooperatives are born of necessity". Such necessity is often the result of market failures in agricultural industries. The role of market failures in cooperative development is explained by Reynold P. Dahl:

Market failure refers to sub-optimal economic performance that results from imperfect competition in markets in which farmers sell their output or purchase farm supplies. The theory of the cooperative firm suggests that if farmers organize a cooperative in an imperfectly competitive market, they can bring about price, output, and efficiency results comparable to those associated with pure competition (Dahl, p.50).

This explanation of cooperative development is often called the "competitive yardstick" theory because it focuses on cooperatives' ability to inject competition into industries characterized by market failures (Rhodes). While the competitive yardstick theory is the most common and widely accepted rationale for cooperative development, there are two other, competing explanations: the coordination or supply management theory and the social school of thought (Christy, p.25). The coordination theory asserts that the primary impetus of cooperative development is the improvement of the coordination of supply and demand for agricultural commodities to achieve prices consistent with production costs (Christy, p.26; Shaffer and Staatz). The social school of thought focuses less on economic issues such as market failures and supply and demand and more on the role of cooperatives in meeting the social needs of farmers (Christy, p.26). Without debating the various merits and drawbacks of these three theories, this paper will focus on the market failure/competitive yardstick explanation while incorporating aspects of the other two theories.

As previously mentioned, market failures occur when the market for a commodity deviates from the model of perfect competition. In a perfectly competitive market:

- (1) There is no product differentiation.
- (2) There are a large number of buyers and sellers of the commodity.
- (3) All firms have access to perfect information about the market.
- (4) There are no barriers to entry and exit.

In contrast, the markets for most agricultural products have the following characteristics:

- (1) There is very little product differentiation.
- (2) There are a large number of producer-sellers, but a small number of buyers.
- (3) Sellers do not have access to perfect market information.
- (4) Sellers are not free to enter or exit these markets easily.

Characteristic (1)--product differentiation--differs little between the model of perfect competition and the markets for agricultural products. Characteristics (2), (3) and (4) of agricultural markets, however, represent significant deviations from the model of perfect competition. These three examples of market failure will now be discussed in more detail.

Markets for agricultural commodities are frequently comprised of a large number of farmers attempting to sell to few buyers. This is particularly true of local markets for agricultural commodities. The presence of few buyers of a good is the primary characteristic of an oligopsonistic market. Buyers in this market are called oligopsonists. Oligopsonistic markets put producers in an unfavorable position because markets where growers have few or only one selling alternative are often characterized by structural or long-term market power (Sexton, Nov. 1986, p.14). Oligopsonists, who do not have to compete for supplies, are in a position of power relative to agricultural producers, who must sell their crop to repay production or other loans. Often, the small number of buyers in an agricultural market is due to large economies of scale in processing or marketing which prevent individual growers or smaller firms from economically performing the same functions.

Insufficient access to necessary market information is another market failure and a cause of market power imbalance (King). In his discussion of cooperative bargaining, Ralph B. Bunje lists market intelligence as a major weakness of the individual farmer. "Those farmers who do have the time to study their market find that the basic information they need to make rational marketing decisions is either not available, incomplete, or inaccurate" (Bunje,

p.41). Buyers, in contrast, are often better informed and have more resources to discover necessary market information.

Accurate market information is important in the price discovery process; producers' lack of market information can result in farmers receiving a price for their goods below that which the market would dictate. In order to make long-term production decisions, agricultural producers need accurate market information about a number of different factors. Producers must have access to information on future consumer demand for their product, and they must be aware of factors affecting future supply, such as product growth characteristics and weather patterns. Some information, such as weather, cannot be definitively determined, while information about product growth can be confusing or ambiguous. Lacking this information, producers are unable to efficiently and accurately coordinate their supply with future consumer demand.

Finally, agricultural producers often are faced with barriers to market entry and, in particular, barriers to exit in the market for which they produce. Farmers can be locked into the production of a particular agricultural commodity for a variety of reasons, such as high levels of capital investment or inability to produce other crops or commodities, due to poor alternative uses for the land or lack of necessary knowledge (Bunje, p.37). When farmers must produce the same crop regardless of market conditions, they have limited options when faced with unfavorable market practices resulting from a high degree of buyer market power.

Consequences of Agricultural Market Failures

In industries characterized by these market failures, agricultural producers are at a clear disadvantage. They can be forced to deal with buyers who have a wide selection of suppliers, who have better market information, and who typically have a smaller capital investment per unit of production (Bunje, p.40). The combination of these factors maximizes the market power of buyers and minimizes, and can even eliminate, the market power of farmer-sellers. Producers' lack of market power often is expressed through

unfavorable economic conditions which are imposed on them in many agricultural sectors.

One indication of a high degree of market power imbalance is producer prices below the cost of production. Such prices can result either from buyers setting the price too low or from competing sellers bidding the price down below profitable levels. In agricultural markets, sellers often are subject to widely variable, unstable prices for their production, which further increase the risks of farming.

Oligopsonists are also likely to be paying different prices to different farmers for no economically justified reason. Such price discriminating behavior is achieved by "playing farmers off against one another and attempting to discern each's minimum selling price for farm production" (Sexton and Iskow, p.7).

Another primary way in which oligopsonists may exert market power is by enforcing terms of trade that are "irritating, costly, and unfair" to growers (Bunjie, p.44). Terms of trade include nonprice factors such as grades and standards, time and conditions of payment, hauling allowances, furnishing of containers by processors, and bypassed acreage (Biggs, p.4). Strict volume and quality requirements, last minute price offers, and the need to pay transportation costs can greatly increase risks to producers and decrease their income.

Furthermore, because buyers have a number of suppliers to choose from, they often are not concerned about fostering the goodwill of individual producers. As a result, buyers can become undependable outlets for individual farmers.

In theory, perfectly competitive markets compel market participants to function optimally. The lack of competition inherent in an oligopsonistic structure permits buyers to function below this optimal level. Thus, buyers in agricultural markets, such as processors or marketers, may provide inadequate or inefficient services.

Any combination of the negative effects of market power imbalance may prompt farmers to form an agricultural cooperative. Farmers may form a cooperative in reaction to extremely low producer prices, unfair terms of trade,

variable prices or market outlets, inefficient services, or a combination of these factors. The kind of cooperative formed ultimately depends upon the specific economic factors existent in the market. The different kinds of cooperatives and their functions will be discussed in a later section.

COOPERATIVES IN SPECIALTY CROP INDUSTRIES

Cooperative involvement has traditionally been strong in specialty crop industries. Specialty crops are crops that are not considered primary agricultural products. Specialty crops include, but are not limited to: fruits, vegetables, nuts, berries, mushrooms, Christmas trees, herbs, honey, aquaculture, nursery stock, and floriculture (Jermolowicz and Stafford, p.4).

Due to the nature of specialty crop industries, producers for these markets are particularly susceptible to market power abuse. In their article in the July 1987 issue of Farmer Cooperatives, Andrew Jermolowicz and Thomas H. Stafford list various characteristics of specialty crops and their industries that may present obstacles to producers of these crops.

One important characteristic of some specialty crops is their perishability. The perishable nature of specialty crops can put producers at a disadvantage if they rely on an outside processing or marketing source. Specialty crops require a short time from harvest to market, and a processor or marketer could take advantage of this time pressure to force down the price paid for the product.

Another characteristic of specialty crop industries is the limited markets they often face. Specialty crops such as Christmas trees face seasonal markets, while others, such as shiitake mushrooms, face thin markets. Thin or seasonal demand may increase competition between suppliers, thereby increasing buyer market power and, most likely, decreasing price.

As in other agricultural industries, farmers may be at a disadvantage if they are locked into the production of a specialty crop. "Because many [specialty] crops require specialized production, harvesting, handling, and packing practices, capital investment can be high" (Jermolowicz and Stafford, p.4). High capital investment in production often cannot be easily disposed of, thus creating a barrier to market exit. In addition, high capital investment requirements in packing or processing have led to fewer firms operating on these levels. Producers of specialty crops stand to suffer from this trend:

Processors of fruit[s] and vegetables are becoming fewer, larger, and more specialized. . .They have become more specific in their requirements for product quantity, quality,

and delivery terms. . .As a result, individual farmers find themselves at a competitive disadvantage (Biggs, p.1).

Producers in many specialty crop industries, particularly fruits and vegetables, have responded to this disadvantage by forming cooperatives. In the fruit and vegetable industries, for example, it is estimated that cooperatives handle approximately one quarter of the total quantity of production from U.S. farms (How, p.169).

AGRICULTURAL COOPERATIVES AND THEIR FUNCTIONS

Cooperatives can be broadly classified as either operational or bargaining (How, p.164). Generally, operational cooperatives seek increased net returns through greater efficiency, while bargaining cooperatives strive to raise market prices and increase net returns by increasing gross revenue.

The key factor distinguishing the two groups is the concept of vertical integration. Vertical integration can be defined as participation by a business in two or more stages of the total production process (VanSickle, p.14). Possible stages of the production process include: manufacturing or purchasing of production inputs; production; assembly; processing; packaging; transportation; wholesaling; and marketing. Vertical integration can occur through contracts between operations at different stages of the production process, or through one business owning operations at different production stages.

When an agricultural producer vertically integrates and expands his production operation into other stages of the production process, he engages either in "upstream" vertical integration by supplying the production unit's own inputs, or in "downstream" vertical integration by moving into production stages closer to consumers (Sexton and Iskow, p.2). Often it is beneficial for agricultural producers to jointly vertically integrate.

Operational Agricultural Cooperatives

Operational agricultural cooperatives are organizations through which farmers may "address market failure by jointly vertically integrating themselves into the market chain" (Sexton and Iskow, p.iv). Agricultural producers form operational cooperatives to increase efficiency in other stages of the production process or to continue the provision of services if investor-owned firms providing necessary services leave the market. The most common forms of operational agricultural cooperatives are supply cooperatives, processing cooperatives, and marketing cooperatives.

Supply Cooperatives

Supply cooperatives are organized by agricultural producers in an attempt to procure their production inputs more efficiently and at a lower cost. Supply cooperatives are an example of "upstream" vertical integration, because through them farmers participate in stages of the production process prior to the actual production of agricultural goods.

There are two different ways in which supply cooperatives operate. Supply cooperatives either make bulk purchases of necessary production inputs or they manufacture their own inputs. The benefits of purchasing supply cooperatives are described by Jermolowicz and Stafford:

Supply cooperatives, organized to purchase essential supplies and materials, are very beneficial to producers. For example, a cooperative's ability to pass on savings from bulk purchases of plants, fertilizer, chemicals, or containers will lower the per-unit input cost for growers patronizing the association. With lower production costs, growers are in a better position to increase returns (Jermolowicz and Stafford, p.5).

The second kind of supply cooperative benefits its members by manufacturing inputs needed in production. Supply cooperatives in the fruit industries, for example, have established manufacturing plants to manufacture input machinery such as mechanical harvesters (Bogard, speech). Supply cooperatives may be able to manufacture inputs more efficiently, thus decreasing input costs and increasing final returns to producers.

Supply cooperatives assist producers in avoiding negative consequences of market failure in agricultural industries. If only a few sources of production inputs exist, a supply cooperative can lower input prices by injecting competition into the market. If there is no supply outlet, a supply cooperative can allow producers to keep producing by creating a source for necessary production inputs. A supply cooperative can also be the answer to undependable or inefficient supply outlets. Furthermore, supply cooperatives, because their members are farmers, can better coordinate the production supplies that are offered with the needs of producers.

Processing Cooperatives

Agricultural processing cooperatives are formed by agricultural producers to provide an economical and efficient processing outlet for their production. Examples of agricultural processing include fruit and vegetable canning or freezing, dried fruit and nut processing, fish processing, and rice milling. Since processing is a stage in the production process closer to consumers, processing cooperatives represent "downstream" vertical integration.

Oftentimes, agricultural producers are prevented from performing their own processing by economies of size. Where processing economies of size exist, it is prohibitively expensive for farmers to perform processing individually. If a group of growers join together, however, unit costs of processing decrease and processing becomes economically feasible. Richard J. Sexton and Julie Iskow offer examples of agricultural processing economies of size in their paper, "Factors Critical to the Success or Failure of Emerging Agricultural Cooperatives". Their paper contains a table listing the number of average-size farms per minimum efficient processing plant for different farm industries. In the vegetable and melon industries, for example, 1,635 average farms are needed to amass the necessary volume to run a minimum size efficient canning plant. Similarly, the minimum number of average fruit and tree nut farms needed to run an efficient canning plant is 2,862 (Sexton and Iskow, p.3). Agricultural processing cooperatives are one means by which farmers may consolidate the necessary volume to efficiently process their product. Hence, processing cooperatives tend to have many members and process large volumes (Smith and Wallace, p.6).

Another benefit of agricultural processing cooperatives is that they have the potential to expand demand at the retail level by improving quality and through the creation of new value-added products. By processing members' products into different forms or foods, processing cooperatives can expand or retain markets for their output (Mather and Preston, p.7).

Processing cooperatives can help agricultural producers counteract negative effects of market failure, in particular, the problems arising from the existence of a small number of buyers. Processing cooperatives can help

producers avoid the consequences of market power imbalance, such as extremely low producer prices, unfavorable terms of trade, and undependable, inefficient services. Processing cooperatives often raise prices, and they provide producers with a fair, dependable market outlet for their production.

Marketing Cooperatives

The primary aim of marketing cooperatives is to develop wholesale and retail markets for specific agricultural products. They achieve this aim by offering products at the times and in the forms, places and quantities that satisfy wholesale and retail demand. Packaging, distribution, storage, sales, and domestic and export market development are all functions performed by marketing cooperatives. These functions represent the participation of farmers in stages of the production process closer to consumers; marketing cooperatives therefore represent another example of "downstream" vertical integration.

As is the case for processing, farmers often do not have the necessary productive capacity required to market their product efficiently. This is a particularly important consideration for fruit and vegetable and other specialty crop farmers who wish to sell to high volume outlets such as grocery chain stores. "Marketing cooperatives representing the interests of several producers, can more easily attract and retain commercial buyers with their ability to consolidate member product and provide volume shipments" (Jermolowicz and Stafford, p.5). Marketing cooperatives also satisfy wholesale and retail demand by providing products of a specified grade or quality and by providing agricultural products in attractive and convenient packaging.

Marketing cooperatives help producers address the problem of market power imbalance resulting from the presence of few buyers and many sellers. They do this by helping producers adapt to terms of trade, e.g. volume requirements, that they would not be able to fulfill individually.

Agricultural Bargaining Cooperatives

Unlike operational cooperatives, bargaining cooperatives are not an example of joint vertical integration. Agricultural producers organize into bargaining cooperatives to achieve common goals, but in the process they do not extend their production operations into any other stage of the production process. Individual farmers may vertically integrate outside the bargaining cooperative, either individually or through membership in another cooperative form, e.g., a marketing cooperative.

The primary function of cooperative bargaining associations is to negotiate between economic agents at different stages of the production process. A bargaining cooperative, for instance, might negotiate between growers and processors or between processors and marketers. Cooperative bargaining associations typically do not physically handle agricultural products. The basic aim of cooperative bargaining associations is to establish the highest price and best terms of trade that can be economically justified by supply and demand and other market conditions (Rhodes, p.320). The price negotiated by a bargaining association is also restricted by the Capper-Volstead Act, which calls for investigation into cases of "undue price enhancement" by agricultural cooperatives.

A second major role of a cooperative bargaining association is to provide its members with timely, accurate market intelligence (Bunje, p.41). Other goals of cooperative bargaining include price stabilization, creation of new markets, and expansion of assured markets (Marion, p.88).

Cooperative bargaining associations have achieved a number of these goals and have played a significant role in some industries. Bargaining cooperatives have been prevented from achieving success in other instances because of their inherent limitations which will be discussed later.

The most tangible benefit of cooperative bargaining is its long-term effect on prices: "Net prices are a little higher, *on the average*, than they would have been [without cooperative bargaining]. Prices are likely to be more stable from year to year. Moreover, prices may be more equitable among producers within the group" (Rhodes, p.321).

Bargaining associations are able to achieve their price goals in part because they tend to increase producers' market power. Ralph B. Bunje, the long-time manager of the California Canning Peach Association, states that "[a] farm bargaining association tends to equalize bargaining power by denying to buyers the natural advantages that have been theirs by default" (Bunje, p.40). Bunje then equates bargaining power with superior market knowledge. Bunje's evaluation thus suggests that bargaining associations can increase their members' bargaining power through the provision of accurate, detailed market information.

Cooperative bargaining associations may also benefit the entire market for an agricultural product. Bruce W. Marion, in his book about the U.S. food system, states that cooperative bargaining "may well move a market characterized by unequal market power in the direction of efficiency," and in the process move the market toward a more nearly equitable state (Marion, p.91).

Sexton and Iskow, comparing cooperatives, give this endorsement of bargaining cooperatives:

It is probably the best of all possible worlds if farmers' price enhancement goals can be attained through a bargaining cooperative. The financial commitment is less than for a marketing cooperative, and concerns about achieving production efficiency in marketing are not relevant (Sexton and Iskow, p.8).

Bargaining cooperatives' benefits to producers stem from their effectiveness in helping producers avoid negative consequences of two important market failures: the presence of few buyers in a market and producers' lack of market information. Bargaining associations gather and disseminate important market information, helping producers to make better informed decisions, and they enable many producers to act as one, thus evening out market power imbalance.

Bargaining cooperatives, however, do have problems and limitations. In general, cooperative bargaining associations achieve their goals in two ways: (1) They play the firms they bargain with against each other, causing them to bid up prices; or (2) They threaten to form a cooperative to perform the services currently performed by the firm with which they are bargaining. For example, a

bargaining cooperative negotiating with an investor-owned marketing firm might threaten to form a marketing cooperative (Sexton and Iskow, p.8). Both of these tactics require that a bargaining cooperative have control of a substantial share of the supply of an agricultural product. In situations when control of such a share of supply is not possible, bargaining cooperatives suffer severe limitations.

Industry-wide cooperative bargaining associations are not likely to succeed in controlling the supply of an agricultural product when there is a widespread diversification of production across geographical areas (Sexton, 1987, p. 18). Such dispersion makes it difficult for a bargaining cooperative to exercise complete control over supply. A bargaining cooperative on a local level, however, may be able to avoid this problem.

Another problem may be faced by growers trying to form a bargaining cooperative to negotiate with a small number of large buyers. "If the one or few firms are strongly opposed to a group effort by what they paternalistically refer to as 'our growers,' they may be able to stop the bargaining association before it even bargains" (Rhodes, p.323).

The most serious threat to the success of a bargaining cooperative, however, is not caused by an outside force; it is posed by agricultural producers within the industry. Because bargaining cooperatives are voluntary organizations, producers may choose not to join the cooperative. These producers are then able to "free ride" by enjoying the price enhancement and other benefits achieved by the bargaining cooperative without paying dues or restricting their supply. The presence of free-riders in a market is not a sustainable condition. Other producers soon follow their lead, and the bargaining cooperative loses control of industry supply and eventually collapses. The presence of free riders will be particularly pronounced when the only service provided by the bargaining cooperative is to set price. One study found that some bargaining cooperatives try to reduce the incentives to free ride by providing additional services to their members such as market information, newsletters, public relations, fieldmen, legislative representation, research, commodity programs and industry representation (Marion, p.89). A strong and committed membership is an important part of a bargaining cooperative's long-term success in achieving its goals.

Other Cooperatives

Many cooperatives in agricultural industries are a combination of these four kinds. Many processing cooperatives, for example, started as bargaining cooperatives; some marketing cooperatives do their own processing. A further complication of this review of cooperative forms is that agricultural producers often have the option of belonging to more than one kind of cooperative. An agricultural producer, for example, may belong to both a supply and a marketing cooperative. Furthermore, cooperatives can themselves hold memberships in other cooperatives; a processing cooperative whose members are producers may itself be a member in a marketing cooperative. Although this discussion of the forms of cooperatives has focused on the four basic kinds (supply, processing, marketing, and bargaining), agricultural cooperatives often involve various functions and intricate relationships.

BENEFITS AND LIMITATIONS OF AGRICULTURAL COOPERATIVES

Benefits

Agricultural cooperatives most noticeably benefit their members when they are formed to provide a service that is not available elsewhere. By providing services where none exist, the cooperative fulfills its most fundamental objective--to serve the needs of its members. Services often are unavailable in agricultural markets because for-profit firms have little incentive to offer them. Sexton and Iskow list three reasons why an agricultural cooperative may be able to operate successfully in markets that no for-profit company will serve:

1. A cooperative may be able to operate more efficiently than unsuccessful for-profit firms.
2. The farmer-members of an agricultural cooperative probably will be willing to accept a lower return on investment than the owners of for-profit companies.
3. An agricultural cooperative can extract more value from product marketing by instituting flexible pricing mechanisms. For example, a marketing cooperative can pay members different prices for their product based on the marginal revenue that can be received for the next unit of production, and then charge a membership fee to cover marketing costs (Sexton and Iskow, p.16).

Many processing cooperatives, for example, have been formed after large, for-profit processing firms closed down. Processing cooperatives have been organized to preserve their members' markets. They have achieved this goal by continuing the proximate demand for members' products, by preserving farmers' link to markets, and by protecting members' production investments. One such cooperative is Pacific Coast Producers, which was formed to process growers' fruits and vegetables after a large cannery closed (Mather and Preston, p.7).

A second benefit of agricultural cooperatives, one which often most interests farmers, is their ability to raise the net profits of their members. Cooperatives can raise their members' net profits by either increasing gross farm revenues or decreasing total farm costs.

Cooperatives are well situated to lower their members' total costs because they operate on an at-cost basis. Instead of trying to make a profit off their farmer-members, cooperatives sell supplies to their members at the price at which they were bought, and pay their members the price for which they sold their products, less any operating expenses. This system reduces farmers' costs because they do not pay for the profit-margins of investor-owned suppliers, processors, and marketers.

Another way agricultural cooperatives reduce member costs is by reducing per-unit supply, handling, or processing costs by assembling large volumes. By doing this, cooperatives allow producers to benefit from economies of scale at each stage of the production process.

On the other side of equation, cooperatives increase farmers' gross revenues through three principal means: controlling the flow of production, developing new markets, and improving product quality.

Effective control of the flow of production can raise producer revenues by decreasing the available supply of agricultural products. Controlling the flow of agricultural production to the market was addressed in the discussion of bargaining cooperatives, during which the limitations of this tactic were discussed. As previously mentioned, supply control is not likely to be effective except, perhaps, on a local level.

Developing new markets for agricultural products can raise farmer revenues by increasing consumer demand for their products. Cooperatives can develop new markets through new product development and activities such as promotion and advertising.

Similarly, improving quality can raise farmer revenues by increasing demand for their product at other stages of the production process. Cooperatives are particularly able to improve product quality. One reason cooperatives have this potential is that cooperatives improve coordination between market demand and supply. Agricultural cooperatives can "encourage production oriented to market requirements by developing producer payment plans based upon meeting grade, size, time, and other market specifications" (Mather and Preston, p.5). Furthermore, cooperatives may be able to offer

better quality production when compared with private handlers of farm products because non-cooperative firms at times will have incentives to skimp on quality (Sexton and Iskow, p.12). When this is the case, an agricultural cooperative may be able to substantially increase farmer gross revenues if it is able to offer clear improvements in product quality.

A third major benefit of agricultural cooperatives is that they inject competition into noncompetitive markets. "Cooperatives, due to their nonprofit and service-at-cost nature, tend to push performance closer to the competitive norm." Cooperatives accomplish this because "they bring more to market at a higher producer price than would be the case if all firms were profit-seeking" (Mather and Preston, p.6). The competitive influence of cooperatives is particularly important because, by pushing agricultural markets closer to perfect competition, cooperatives decrease the market power of large buyers in the industry and increase the market power of agricultural producers.

Another benefit of agricultural cooperatives that is extremely important to their members is risk reduction. By providing steady, dependable outlets, by expanding markets, and by equalizing market power within agricultural industries, cooperatives reduce producers' risk by establishing consistent, stable markets and prices for agricultural production.

A final benefit of agricultural cooperatives arises from the fact that they are democratically owned and controlled by their farmer-members. Richard J. Sexton explains this benefit in reference to marketing cooperatives:

By forming cooperatives to market their products, growers remove the conflict of interest between buyer and seller. The cooperative marketing association wants to pay its member producers the highest possible price subject to covering costs (Sexton, Nov. 1986, p.14).

This benefit is equally true for other cooperatives that directly transact with their members, such as supply cooperatives and processing cooperatives.

Limitations

Agricultural cooperatives have a number of limitations, some of which have already been discussed. Agricultural cooperatives are limited in their ability to increase producer returns by the fact that they have traditionally been

unable to fix prices of agricultural goods. Cooperatives' lack of success in price fixing has primarily been due to their inability to control production. Another factor limiting cooperatives' ability to fix agricultural product prices is elastic consumer demand for agricultural products. Often, if the price of an agricultural product goes up, consumers react by purchasing less of the product and more of substitute products. Thus, even a cooperative with complete control of the supply of an agricultural product cannot raise prices above what consumers are willing to pay without ultimately losing revenue.

Another limitation of agricultural cooperatives is summarized by J. Warren Mather and Homer J. Preston: "Cooperatives generally cannot short-circuit the marketing system or functions within it" (Mather and Preston, p.19). While cooperatives sometimes can eliminate middlemen in the marketing system, marketing functions cannot be eliminated; any functions previously performed by middlemen must now be performed by the cooperative.

Sexton and Iskow identify two common weaknesses of agricultural cooperatives: difficulty in obtaining equity capital and failure to reward entrepreneurial activity (Sexton and Iskow, p.46). Cooperatives that return all their profits, less operating costs, to members cannot retain equity within their operation. A lack of equity capital can stunt the growth of an agricultural cooperative.

The democratic nature of agricultural cooperatives, while beneficial in other ways, can also stunt cooperative growth by discouraging entrepreneurial activity. Decisions made by group consensus, in particular, can inhibit the progress of individual ideas.

AGRICULTURAL COOPERATIVE KEYS TO SUCCESS

The popular saying asserts that "cooperatives are born of necessity." Sexton and Iskow, in their report on the success and failure of emerging agricultural cooperatives, concur:

The first key to successfully developing an agricultural cooperative is that the organization have a genuine economic role to play. The cooperative must be able to provide net benefits for its members in excess of what is available through other market channels (Sexton and Iskow, p.18).

Given that farmers often form cooperatives in response to a perceived need in the marketplace, it seems likely that most cooperatives would succeed under this criterion. This assumption is reinforced by statistical data on the prevalence of cooperatives.

The number of agricultural cooperatives in the United States has steadily declined since 1928. Despite declining numbers, however, cooperatives' farmgate market share rose from 20% of marketing sales in 1950 to about 30% in the 1980's. Sexton evaluates these numbers:

In assessing cooperatives' recent economic performance, the rising share statistics speak for themselves. Utility-maximizing farmers would not have turned increasingly to cooperatives if they did not represent the best available option (Sexton, Dec. 1986, p.1171).

The second key to success Sexton and Iskow identify is a well-planned and efficient organizational, financial, and operational framework within the cooperative. "Even cooperatives that are born of necessity may fail if they lack sufficient membership and volume, are improperly financed, or are poorly managed" (Sexton and Iskow, p.1).

A third key to success that can be added to Sexton and Iskow's list is that cooperatives must be aware of current trends and factors that influence them and be flexible and able to adapt to change.

CURRENT FACTORS INFLUENCING AGRICULTURAL COOPERATIVES

Sexton, in a December 1986 article, identifies emerging factors shaping agricultural cooperatives, three of which are relevant today:

- (1) Greater price and income volatility due to reduced government involvement in agriculture and increased international competition;
- (2) Fewer and larger marketing sector firms;
- (3) Fewer, larger, and more specialized farms.

As discussed in the section on cooperative benefits, one reason farmers join agricultural cooperatives is to try to establish more stable market outlets for their production. Thus, a trend toward greater price and income instability may lead to increased cooperation in agricultural industries.

A trend toward fewer and larger marketing sector firms leaves agricultural producers with less selling options and increases the market power of the remaining buyers. Buyers may exercise their increased influence by increasing their demands and paying lower prices. This, in turn, may lead more farmers to organize marketing cooperatives to provide the same services or to develop bargaining cooperatives to try to counteract the increased market power of the few, large marketing firms.

The third factor, fewer and larger farms, is part of a larger trend toward a bimodal size distribution of farms. Increasingly, the number of medium-sized farms has decreased while the number of small and large farms has increased. The trend toward more small farms may curtail the growth of agricultural cooperatives. Studies have shown that farmers operating small farms are less likely to be members of an agricultural cooperative than other farmers (Sexton, 1987, p.18).

The trend toward larger farms holds mixed consequences for agricultural cooperatives. On one hand, a trend toward more large farms joining cooperatives would enhance cooperatives' prospects for production control. In addition, cooperatives whose members are primarily large farms will face lower

transactions costs in organizing, due to concentration of production (Sexton, Dec. 1986, p.1171).

The trend toward larger farms, however, holds possible negative consequences for cooperatives. One negative consequence is explained by David K. Smith and Henry N. Wallace:

Increases in farm size, and to a lesser extent changes in processing technology that allow more flexibility in scheduling processing of the raw product at harvest, will have the impact of increasing growers' opportunities for individual vertical integration without investment in a cooperative (Smith and Wallace, p.18).

Thus, the trend toward larger farms may lead farms to individually undertake services that would be provided by a cooperative.

Sexton offers suggestions on ways agricultural cooperatives can attract large farms. These include: "basing voting on patronage rather than one person-one vote and amending patronage finance to include volume discounts, price premiums, etc." (Sexton, Dec. 1986, p.1171).

This section has discussed cooperatives in specialty crop industries in general. Reasons for cooperative formation were described from the point of view of market failures in specialty crop industries and the consequences of market failures. Different kinds of cooperatives and their functions were then described. The benefits and limitations of cooperatives in specialty crop industries were examined. Finally, cooperative keys to success were addressed and current factors influencing agricultural cooperatives were discussed.

CASE STUDY 1: THE U.S. TART CHERRY INDUSTRY

COOPERATIVES IN THE U.S. TART CHERRY INDUSTRY

Tart cherries are a minor, specialty crop in the United States. Tart cherries are extremely perishable and virtually the entire crop is processed. Tart cherries are initially processed into four basic forms: frozen, canned, pie filling, and juice. A recent trend in the tart cherry industry is toward more frozen cherries and less canning. Most frozen tart cherries are remanufactured into prepared desserts, such as pies and tarts. Thus, other pie fruits such as apples, blueberries and peaches are important competing commodities. Next to apples, tart cherries are the second most important pie fruit in the U.S. (RHC, p.5).

Tart cherry production is very geographically concentrated: Michigan alone produces 70-75% of the annual tart cherry crop. In the United States, tart cherries are produced by over two thousand growers (Ricks, p.243). Tart cherry trees have a regular bearing cycle; they begin to bear cherries five to ten years after they are planted and continue to produce for 20 to 25 years. All of these factors affect the formation and functions of agricultural cooperatives in the tart cherry industry.

REASONS FOR COOPERATIVE FORMATION IN THE TART CHERRY INDUSTRY

Market Failures

Many of the reasons for agricultural cooperation in the tart cherry industry can be traced back to market failures within the industry and to ways in which the tart cherry industry deviates from the model of the perfectly competitive market. One such market failure is the existence of many sellers but few buyers for tart cherries at different levels in the marketing system. In the market for raw cherries between producers and processors, a relatively large number of producers have traditionally sold cherries to a smaller number of processor-buyers. Recently the number of processor-buyers has increased, but locally, growers often still have only two to five alternative buyers. Thus, this market might be described as a local or regional oligopsony (RHC, p.21).

An oligopsonistic structure is also apparent at a different level of the production process: the market for frozen cherries. This market has traditionally involved many tart cherry processors selling frozen cherries to a few large dessert manufacturers. Recently, the number of processor-sellers has grown, as more growers have started performing their own processing, while the large food manufacturers have become fewer and more concentrated (Marion, p.181). Thus, the selling side of the frozen cherry market is becoming even more competitive while the buying side is becoming increasingly oligopsonistic (RHC, p.70).

Another market failure in the tart cherry industry that disadvantages producers is lack of necessary market information. One way to balance supply and demand would require transmitting information regarding expected consumer demands for 5-10 years in the future back to the growers so they could make the necessary investments in orchards (RHC, p.41). Consumer demand information for 5-10 years in the future is needed due to the lag time between when new cherry trees are planted and when they begin to bear fruit. Unfortunately, future consumer demand information is generally not available. Thus, producers frequently must make production volume and planting decisions based on demand and market prices from recent past years. This

system assumes that the past will be repeated, an unlikely assumption which often leads producers to over- or under-produce.

Expected consumer demand data, however, is not the most critical piece of market information that tart cherry producers lack. Product characteristics, in particular the effects of the bearing cycle, and variable weather patterns are the most important factors that dictate tart cherry production. Producers' lack of information in these two areas directly influences the element most responsible for the formation of agricultural cooperatives in the tart cherry industry: wide fluctuations in tart cherry supplies. The supply of tart cherries drastically changes from year to year, recently ranging from 140 to 310 million pounds (see Figure 1). The 1976 crop of tart cherries, for example, was only 48% of the 1975 crop (RHC, p.2,11).

Donald J. Ricks traces the source of production fluctuations back to two primary factors:

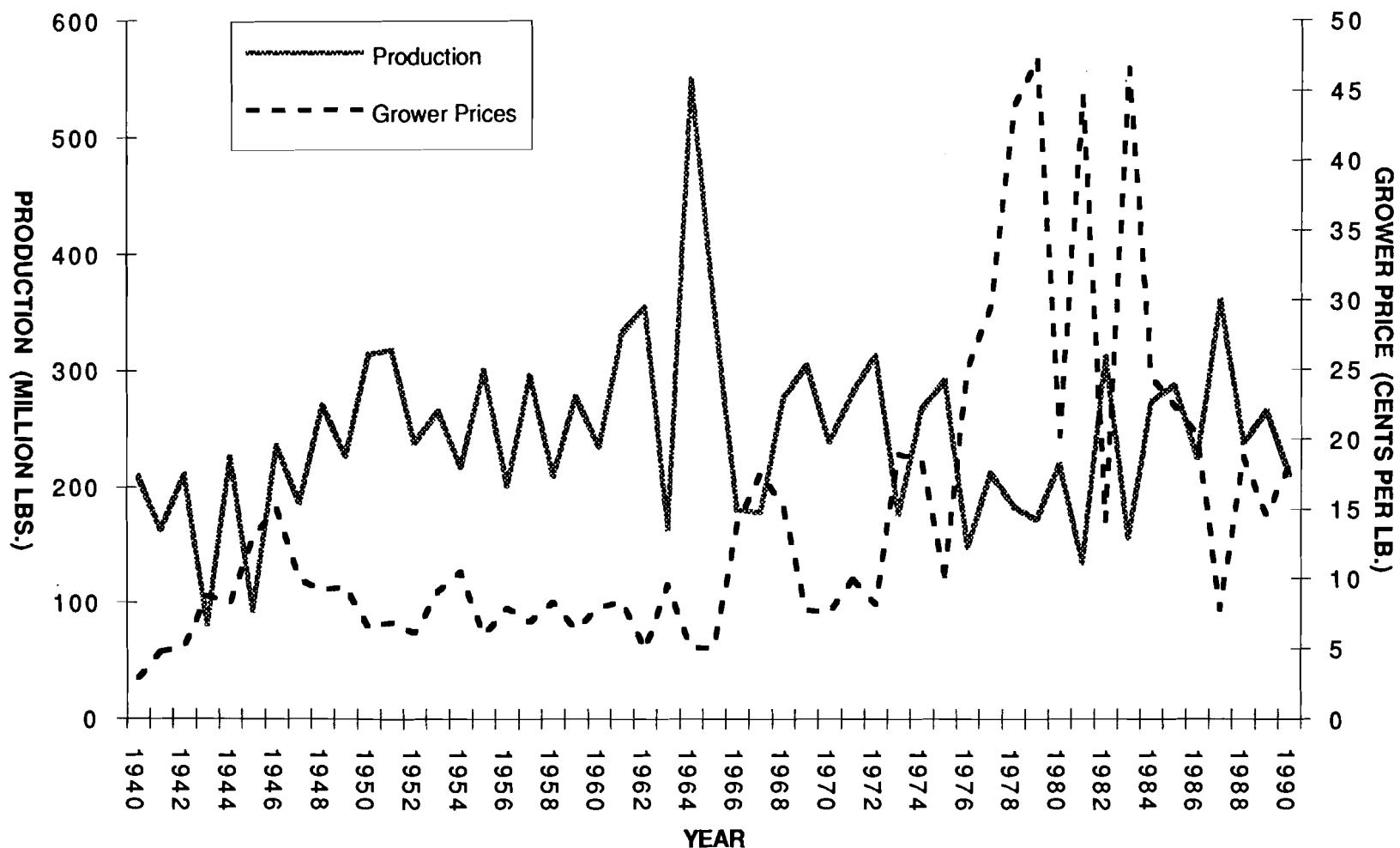
- (1) Long-term cycles of the relationship between industry orchard productive capacity and overall demand for tart cherries, and
- (2) Wide annual fluctuations in the nation's tart cherry production (Ricks, p.243).

One the primary causes of the long-term cycle is the bearing cycle of tart cherry trees. Ricks describes the course of the long-term cycle:

During each cycle there is typically a shortage period or phase. This is followed by a period of expanding production in which supply and demand are in approximate balance. Then there is a period of overproduction and low grower prices. Growers begin to remove acreage and a period of declining production occurs. Several years later another shortage period occurs and then the cycle begins again (Ricks, p.243).

Because of the tart cherry tree bearing cycle, producers are unable to quickly and efficiently respond to positive market price signals. If prices are high due to a cherry shortage, producers who plant new trees must wait five to ten years for the resulting expanded cherry volume. By this time, the demand for cherries may have fallen and may be inadequate to permit sales of the increased production at prices that will cover production costs (RHC, p.45).

FIG. 1: U.S. TART CHERRY PRODUCTION AND GROWER PRICES 1940-1990



SOURCE: USDA 1990. "Noncitrus Fruits and Nuts: 1990 Summary" (and previous years). Washington, D.C.: Statistical Reporting Service.

The long term production cycles are exacerbated by annual fluctuations in tart cherry production. Annual fluctuations are primarily caused by killing spring freezes. Due to the geographic concentration of tart cherry production, the same weather conditions affect much of the nation's cherry crop (RHC, p.11). Contributing to the effects of weather fluctuations is the tendency of tart cherry trees to bear a larger crop in alternating years (RHC, p.11). Annual crop fluctuations further confuse market signals in the tart cherry industry. In particular, producers who are trying to determine the position of the tart cherry industry on its long-term cycle can be misled by annual production fluctuations (Ricks, p.244). Accurate market information regarding the position of the tart cherry industry in regard to its long-term production cycle and precise weather predictions would assist growers in coordinating their supply with consumer demands.

Another characteristic of the perfectly competitive market that is violated in the market for tart cherries is that of easy market exit and entry. An individual may enter the tart cherry industry by planting new orchards or buying existing orchards. "In both cases, rapidly rising investment requirements are providing growing entry barriers for many potential cherry growers" (RHC, p.17). The large capital investment requirements that make it difficult to enter the tart cherry industry also create barriers to exit. Due to capital investments, tart cherry producers cannot easily switch to growing more profitable agricultural crops on their land if tart cherry prices drop; cherry trees are not an easily convertible asset.

Consequences of Market Failures

The primary consequence of market failures in the tart cherry industry is to increase risks to tart cherry producers. Producers' risks are increased by many of the economic conditions resulting from market failures: low, variable prices; high overhead costs; inadequate and undependable market outlets; and a reduction of long-run demand for tart cherries.

In large-crop years, particularly those coinciding with a high point on the long-term production cycle, growers receive very low prices for their cherries.

Prices often are well below growers' costs of production in years of large supplies (Ricks, p.250). Low grower prices can result from a number of market failures in the tart cherry industry. Overproduction results from the product fluctuation cycles and inadequate market information; growers are prevented from leaving the market in years of low prices because of barriers to exit; and the existence of few buyers and many sellers leads to unequal market power.

Short-crop years can also have negative consequences for growers. In these years, growers often suffer from high per unit overhead costs. Grower investment in machinery such as mechanical harvesters lead to high fixed costs. Production investments often work by the principle of economies of size and are economical only for large volumes. A small crop year raises the per-unit fixed costs of such operations and forces producers to use equipment that is not economical for small volumes. These factors raise growers' overhead costs as a percentage of gross revenue and thus reduce net profit. The principal market failure responsible for high per unit overhead costs is producer market entry and exit barriers due to high levels of capital investments.

Some of the biggest risks to producers arise from having undependable and/or insufficient market outlets. Undependable market outlets are a particular problem for tart cherry producers due to the perishable nature of their product. Processing of tart cherries must be done within hours after harvest in order to maintain product quality (Marion, p.184). If tart cherry growers have undependable processing outlets, they may not be able to achieve this necessary coordination and, thus, may lose their crop. The risk of undependable market outlets is primarily due to the presence of few buyers and many sellers in the market.

Possibly the worst grower problem occurs when growers are unable to sell their crop at any price due to inadequate market outlets. This situation, like the existence of low prices, is particularly apt to occur in large-crop years during the surplus portion of the long-term cycle. Ricks, Hamm, and Chase-Lansdale explain why this situation occurs:

Because tart cherry production in a given geographical area may fluctuate as much as 500% from one year to the next, processing facilities with sufficient capacity to handle the largest crops in the area would be used at approximately 20% of capacity in some of the short-crop

years. This type of situation results in high overhead costs per pound of processed cherries. . .[T]here have been large-crop years when even the entire industry's facilities were insufficient to process the crop within the necessary harvest period (RHC, p.14).

This situation also results from many of the aforementioned market failures in the tart cherry industry. Market power imbalance due to the oligopsonistic nature of the tart cherry market, barriers to market exit for producers, the extreme perishability of tart cherries, and wide production fluctuations all contribute to a situation where growers have no market for their cherries.

A final way in which market failures in the tart cherry industry increase risk for tart cherry growers is by reducing long-run demand potential for tart cherries and subsequently threatening the viability of tart cherry production. Wide fluctuations, in particular, hamper long-term demand growth. High prices in short-crop years and wide price and quantity fluctuations frequently lead food manufacturers to drop cherries and substitute other ingredients with more stable supplies and prices. Long-run demand potential is further reduced by the instability of cherry supplies because food manufacturers are deterred from developing new cherry products (Ricks, p.250). This trend poses a threat to tart cherry producers' livelihoods; if enough manufacturers drop cherries and substitute other fruits, demand for tart cherries will decrease significantly and many tart cherry producers will be forced out of the industry. The market failure most responsible for this situation is lack of complete market information which can lead to wide production fluctuations.

GROWER INSTITUTIONS IN THE TART CHERRY INDUSTRY

Producers have reacted to the negative consequences of market failure by joining together in an effort to reduce risk. Producer group-action institutions have been organized to reduce supply instability, expand demand, and provide growers with a more active role in the subsector. Four forms of producer institutions in the tart cherry industry are cooperatives, a federal marketing order, cooperative-corporation joint ventures, and farmer bargaining associations (Marion, p.178-9).

Cooperatives

Processing Cooperatives

One form of producer cooperation in the tart cherry industry that has expanded rapidly in recent years is grower-processor cooperatives. In 1970 approximately 83% of tart cherry processing capacity was controlled by investor-owned firms. By 1984 this number had shrunk considerably, with 80 to 85% of the processing capacity owned by cooperatives and grower-processors (Marion, p.181). The trend toward more grower processing, both by processing cooperatives and, for the largest growers, individual grower processing, has been motivated by two primary factors. The two primary benefits of grower integration into processing are better coordination of mechanical harvesting with processing and ensured processing outlets for growers' production (Marion, p.180).

The issues of coordination and crop outlets were both highlighted by the development and adoption of mechanical harvesting in the tart cherry industry. After mechanical harvesting was introduced, producers were able to harvest cherries much faster than they could be processed. However, at the time when mechanical harvesting was increasing the need for processing, processing capacity in the industry declined (RHC, p.48).

In order to preserve their crop, growers must ensure that their cherries are processed within hours after harvest. Vertical integration has proved to be the best means for growers to coordinate the increased harvested crop volume from mechanical harvesting with processing. Unlike those in most other

agricultural industries, the economies of size for processing in the tart cherry industry are relatively small. Three or four moderately large growers can jointly build a processing plant and have sufficient volume to obtain processing economies of size (Marion, p.180).

As previously mentioned, the second benefit of processing cooperatives, ensured processing outlets, can be extremely important to growers in large-crop years: "With ownership in a processing facility growers gain access to the limited industry processing capacity during the short period of time when it is needed" (RHC, p.17). Processing cooperatives thus enable producers to avoid one negative consequence of market failures in the tart cherry industry, the lack of an immediate outlet for their crop.

Processing cooperatives have also been formed in the frozen cherry market of the tart cherry industry where frozen cherries are remanufactured into products such as pie filling. Within the last twenty years, cooperatives have become involved in this market through the purchase of pie filling operations, such as pie-filling divisions spun-off by large food conglomerates (RHC, p.26). Cooperatives have made these purchases in order to assure a market for their commodity at the next stage of the production process. Commodity cooperatives are willing to accept lower returns on investment than are large food firms and thus may be able to economically run pie filling divisions abandoned by for-profit food manufacturers. In this way, cooperatives can achieve effective forward vertical coordination, enhance their market access position, and ensure a market for growers' products at the next step in the production process. Through these achievements, processing cooperatives help producers counteract the negative effects of market failures in the tart cherry industry.

Marketing Cooperatives

The growth of tart cherry grower-processing cooperatives and individual grower-processors has increased the number of sellers in the frozen cherry market and has pushed oligopsonistic market structure in the tart cherry industry forward one step in the production process. Instead of agricultural producers, the numerous market sellers are now grower-processor cooperatives and individual grower-processors; the basically undifferentiated product is now

frozen cherries instead of raw cherries; and the few, powerful buyers are now food manufacturing firms, instead of investor-owned processors. In an attempt to counteract the negative effects of the market power imbalance inherent in the oligopsonistic structure, some grower-processor cooperatives and individual grower-processors have consolidated their production and formed marketing cooperatives. Cooperatives whose members include other cooperatives are called federated cooperatives. RHC predict that federated marketing cooperatives for cherries will become increasingly important in the future (RHC, p.71).

Cherry Central Cooperative, Inc.

One example of a federated marketing cooperative for cherries and other processed fruits is Cherry Central Cooperative, Inc. in Traverse City, Michigan. Cherry Central has 17 processor member-stockholders, the majority of which are cooperatives (Bogard, speech). The primary items manufactured by Cherry Central are tart cherries, sweet cherries, apples, blueberries, applesauce, apple juice, and other fruit products (Bogard, speech). Cherry Central markets these products to retail stores, food service and bakery companies, such as Sara Lee® (Bogard, interview). Recent marketing sales totals for Cherry Central have averaged approximately 40 million dollars (Bogard, speech).

Cherry Central was founded in 1973 by a group of five cherry processors. These processors had been marketing their tart cherries separately and concluded that they would most likely get a higher return for their products if they marketed collectively.

In addition to its marketing services, Cherry Central also provides some of the advantages of a supply cooperative for its members. Richard L. Bogard describes one of the supply services provided by Cherry Central:

Cherry Central also operates a can division whereby we manufacture the 30 lb. fruit cans that most cherries and apples are put in to go to the freezer after the production season. Since the production season only runs for a few weeks on cherries during the summer. . .the product has to be processed and then moved to the freezer for storage. Since all of our members use these 30 lb. fruit cans, . . .by buying steel and owning a can making

manufacturing plant together, they can all share the reduced cost of this container (Bogard, speech).

Cherry Central also owns a machinery manufacturing plant that was purchased to continue the development and manufacturing of cherry pitting machines and other fruit processing equipment (Bogard, speech). Like the can manufacturing plant, the machinery building plant saves the members of Cherry Central money, and ensures that they have the production and processing inputs they need.

By consolidating members' production, Cherry Central helps processor cooperatives circumvent the superior market power of large food manufacturers. And on the supply side, Cherry Central Cooperative enables processors to establish less costly, more stable sources for their processing inputs.

The Tart Cherry Federal Marketing Order

Another producer group-action institution that was established to help reduce price and income fluctuations is the tart cherry federal marketing order. When it was established, the federal marketing order had two parts--an industry-wide storage program and a demand expansion program.

Industry-Wide Storage Program

The industry-wide storage program, which operated in the 1970's and early 1980's, attempted to stabilize prices and producer incomes by stabilizing the supply of cherries available to the market. The primary purpose of the storage program was to store tart cherries in large-crop years and supplement tart cherry supplies in short-crop years through the use of a storage reserve pool. Economically, this approach was possible "because the price increases from large crop to short crop are typically several times greater than the costs for storage, interest, and handling of the stored cherries" (Marion, p.182). The most serious potential problem of the storage program was the risk of having two or more large crop years in succession.

From the grower's point of view, the expected results of the program were higher prices in large-crop years than without the program and more cherries to sell in small-crop years. From the point of view of manufacturers, retailers, and

consumers, the storage pool was seen as a way to stabilize supplies and prices from year to year (RHC, p.62). In his discussion of the tart cherry marketing order, Ricks concludes that the storage program stabilized annual supply fluctuations somewhat and economically benefited the tart cherry industry (Ricks, p.252).

In 1986, the Secretary of Agriculture decided to terminate the tart cherry marketing order storage program based on the results of a continuance referendum in which a majority of both growers and processors by tonnage voted for continuance of the program, but slightly less than a majority of the number of growers voted to continue the program (Ricks, p.252).

Demand Expansion

Demand expansion is the second program within the federal tart cherry marketing order. The marketing order calls for an industry-wide demand expansion program that is financially supported by tart cherry growers. Funds for the expansion program are collected from growers through state marketing orders. RHC describe the current focus of demand expansion activities:

Because a high percentage of tart cherries are sold as an ingredient for manufacturers of branded food products, much of the cherry demand-expansion efforts are aimed at increasing the emphasis on cherries in product-line and merchandising decisions of food manufacturers and at including more cherries in the menus of food service and institutional establishments. The demand-expansion efforts also involve attempts to: (1) stimulate development of new manufactured products using cherries, (2) determine obstacles to expanded use of cherries and (3) work with food companies to overcome those obstacles to expanding demand (RHC, p.37).

Since demand expansion activities are usually funded by a percentage checkoff on marketed production, available funds for demand expansion shrink in short cherry crop years. A further reason demand expansion is often substantially curtailed in short-crop years is lack of sufficient supplies to support an expanded demand (RHC, p.37).

Although the program is entitled demand expansion, it focuses in part on counteracting the negative effects of production fluctuations in an attempt to

preserve present manufacturing demand. Thus, this program encompasses demand *maintenance* as well as demand *expansion* (RHC, p.52).

Cooperative-Corporation Joint Ventures

Cooperative-corporation joint ventures are a third example of producer group-action institutions formed in the tart cherry industry to help stabilize producer prices and incomes. Cooperative-corporation joint ventures can assist tart cherry producers by increasing consumer access to their products and expanding demand for products such as cherry pie filling through the use of the food company's established brand name (RHC, p.73).

One existing cooperative-corporation joint venture operates in the retail-size cherry pie filling market. Pro-Fac, a cooperative that packs retail-size cherry pie filling, has a long-term joint venture agreement with Curtice Burns, an investor-owned food marketing firm. Pro-Fac provides raw product supplies, facilities, investment, and some financing, while Curtice Burns provides the brands, marketing activities, and management (Marion, p.181).

Cooperative-corporation joint ventures can further help tart cherry producers by expanding development of new tart cherry products, particularly if cherry cooperatives pair with a food marketing corporations with strong brands and the ability and willingness to develop new cherry products.

Tart Cherry Bargaining Associations

Cooperative bargaining associations are the fourth type of producer group-action organization formed in the tart cherry industry. Tart cherry bargaining has expanded in recent years, and now encompasses a majority of the annual crop. The share of processed tart cherries negotiated by bargaining associations measured in cash receipts rose from 44% in 1978 to 80% in 1982 (Skinner, p.5).

The rising popularity of bargaining associations can be traced in part to their goals for their grower-members, including higher prices, better and more accessible market information, and reduced risks. Other goals of cooperative bargaining associations include aiding in the price discovery process, reducing risks to processors, and reducing annual price fluctuations.

One way bargaining associations have been able to increase grower prices is by obtaining uniform pricing from all tart cherry processors in a given area. Uniform pricing guarantees that processors are not paying more for raw cherries than their competitors, and in turn, reduces processors' risks. This risk reduction is then passed down to producers in the form of slightly higher and more stable grower prices (RHC, p.16).

Cooperative bargaining associations have also sought to increase grower prices by altering the market power situation in favor of tart cherry growers (RHC, p.73). While the high percentage of tart cherry tonnage represented by bargaining associations seems to point to bargaining associations' having a high degree of market power, there are limitations to bargaining association market power which will be discussed later. Cooperative bargaining associations have sought to overcome these limitations in an effort to fully exploit their oligopolistic position.

The dissemination of market information is an important purpose of all bargaining associations. In the tart cherry industry, cooperative bargaining associations have been able to help build, organize, and publish important information in the subsector (RHC, p.74). Market information, such as crop estimates, can play an important role in reducing the uncertainties that tart cherry producers face.

The third goal of tart cherry bargaining associations, reducing producer risks, has been achieved in some cases. There is a high degree of price and inventory risk inherent in the tart cherry subsector, which can be shared by different participants in the industry or shouldered by one. Participants in the tart cherry industry often are attempting to shift risk-bearing functions away from them, onto other participants in the subsector. Risks traditionally have been passed down from grocery retailers, wholesalers, and food manufacturers through processors to growers. By providing tart cherry growers a degree of market influencing ability, bargaining associations have enabled growers to shift some of the risks forward to processors (RHC, p.73).

A new development in the area of tart cherry cooperative bargaining associations that may enable them to better achieve their goals is interaction

between processing and bargaining cooperatives. RHC describe the potential benefits for both organizations from such an arrangement:

Processing cooperatives can provide useful information to bargaining cooperatives in regard to supply and demand conditions, market and trade trends, and economic conditions affecting processors. These types of information can be useful to bargaining associations as background for making realistic decisions regarding their price and terms of trade negotiations with proprietary processors. . .Bargaining cooperatives provide information and influence processing cooperatives through information to growers, through some dual membership in both types of cooperatives, and through their bargaining activities as they affect price levels, even though bargaining cooperatives do not bargain directly with processing cooperatives (RHC, p.71-72).

Thus, by working with processing cooperatives, bargaining cooperatives may be able to provide their producer-members with better market information, higher prices, and/or reduced risks.

Cooperative bargaining associations' contribution to the welfare of tart cherry growers through the attainment of producer goals, however, have not reached their potential due to limitations on the market power of bargaining associations. The market power of tart cherry bargaining associations is limited by: (a) the tart cherry tonnage processed by cooperatives, (b) the tart cherry tonnage of growers who are not members of a bargaining association, and (c) the highly perishable nature of the crop (RHC, p.74).

Tart cherry bargaining associations traditionally have bargained exclusively between growers and investor-owned processors. As the importance of cooperative processing has increased and the percentage of tart cherries purchased by investor-owned processors has decreased, the role of tart cherry bargaining associations has also decreased (Marion, p.183). The importance of tart cherry bargaining associations has also decreased as a result of a higher percentage of on-farm tart cherry processing, and other factors which reduce bargaining association membership. As both forms of grower processing have expanded, the tonnage of raw cherries sold by producers has decreased and the tonnage of frozen cherries sold by producers has risen rapidly. Bargaining associations typically only handle raw cherries, thus tart

cherry bargaining has become a "thinner market" (RHC, p.76). The shrinking market for raw cherries has decreased the importance of tart cherry bargaining associations, particularly because the impact of raw cherry bargaining only indirectly affects the market for frozen cherries (RHC, p.19).

Tart cherry cooperative bargaining associations' market power has not been large for other reasons as well. In particular, the highly perishable nature of tart cherries and the fact that variable harvest costs constitute a low percentage of the total value of the product both contribute to bargaining associations' limited degree of market power (RHC, p.16).

Michigan Agricultural Cooperative Marketing Association, Inc. (MACMA)

The Michigan Agricultural Cooperative Marketing Association is the Michigan Farm Bureau's marketing affiliate company. It was organized in 1961 to provide marketing, bargaining, and various group marketing and related services. MACMA's major objective is the attainment of full market value for the commodities of its over 2,000 farmer-members.

MACMA is organized by commodity divisions. One group of commodity divisions is the fruit for processing group. MACMA fruit divisions influence and establish prices, grades and other terms of trade through negotiations with processors and various price leadership activities. Newsletters and toll-free phone lines provide price, crop and market information (MACMA information sheet).

Within the fruit for processing group, MACMA operates the Red Tart Cherry Growers Division. The Red Tart Cherry Growers Division was organized in 1968. The division is MACMA's largest membership division with about 900 members representing about 70% of the annual Michigan crop. The division administers the activities of the Michigan Cherry Committee, which is responsible for the operation of the statewide red tart cherry and sweet cherry promotion and advertising program (MACMA brochure). While MACMA provides marketing services for other commodities it handles, it operates strictly as a bargaining association with regard to tart cherries. The MACMA Red Tart Cherry Growers Division organizes negotiations between growers and

processors and publishes an information newsletter for its producer-members (Preston).

The primary role of the division has been to improve tart cherry growers' net returns through a variety of programs. These programs include collecting and disseminating price and market information, recommending a raw product price schedule, working to unify activities between producing states, improving crop estimates, and representing the growers' interest in various legislative and regulatory issues (Nye, p.170).

COOPERATIVE BENEFITS AND LIMITATIONS IN THE TART CHERRY INDUSTRY

Many of the benefits of cooperatives in general apply to tart cherry cooperatives. Most noticeably, tart cherry cooperatives have benefited growers when they have been organized to provide services that elsewhere are unavailable or inadequate. This has particularly been the case with tart cherry processing. RHC emphasize this point, stating: "At the present time, the industry seems to have sufficient processing capacity to handle most cherry crop sizes even with mechanical harvesting. The main contribution to the solution has been grower investment in more processing facilities" (RHC, p.49).

Tart cherry cooperatives have also been able, in some cases, to raise growers' net profits. Cooperatives have accomplished this either by increasing gross revenues, decreasing costs, or both. Often, tart cherry cooperatives have raised revenues for growers. In a number of years tart cherry cooperatives have returned somewhat higher average prices to growers than the market at harvest time (RHC, p.33).

Like all agricultural cooperatives, tart cherry cooperatives have reduced costs to their members by offering services on an at-cost basis. This principle has helped growers save money by spending less to purchase production inputs and to process and market their cherries.

Tart cherry growers have also benefited from the added competition cooperatives bring to non-competitive markets. This competition has often led to higher prices being offered for growers' cherries by cooperatives and investor-owned firms alike.

The democratic nature of tart cherry cooperatives has also been an asset for growers. Growers often value having influence over processing and marketing decisions and operations and having a say in the kinds of research and development done with their products (Bogard, speech).

Finally, growers can benefit from the improved coordination cooperatives allow between services offered and grower needs. Such coordination often concerns non-price services. Non-price services may be of such importance that a cooperative that offers certain non-price services may be able to return a

lower price to growers than investor-owned firms and still stay in business. RHC explain how this might happen:

A processing cooperative may be able to maintain a somewhat lower price (grower return) over a long period of years if the cooperative provides special services to the grower that the proprietary processors do not. Such special services of a processing cooperative might include items such as (a) guaranteed processing capacity in both large-crop and short-crop years, (b) a willingness by the co-op to process an entire crop and market over a 2-3 year period rather than force the grower to let part of the crop drop on the ground, (c) an assured market outlet for other fruits raised by the grower, (d) reduced costs for growers' purchased inputs, (e) more convenient receiving stations, (f) providing a more "just" raw product grading system, (g) operating the plant over a longer season to accommodate growers, (h) more convenient daily delivery schedules for the grower, and (i) providing unusual financing to growers under certain conditions (RHC, p.33).

The added convenience for growers of services such as these may more than make up for a lower product price.

Tart cherry cooperatives are limited by the same factors limiting cooperatives in general. Tart cherry cooperatives are not able to control production and fix prices at a revenue-maximizing level for growers. They also are limited in the degree to which they can raise prices by the elasticity of consumer demand for tart cherry products. And while tart cherry cooperatives can make the tart cherry market more efficient by eliminating middlemen, they cannot eliminate the functions performed by middlemen in the marketing system.

One particularly important limitation of tart cherry cooperatives is the risk-bearing function they play. When growers form a processing cooperative, for instance, they accept the seasonal pricing risk previously borne by processors (RHC, p.33). The increasing percentage of tart cherry tonnage processed by cooperatives seems to indicate growers' willingness to accept these risks. Organized tart cherry bargaining cooperatives, however, may be able to shift the risk-bearing function to another participant in the industry.

CURRENT FACTORS INFLUENCING COOPERATIVES IN THE TART CHERRY INDUSTRY

Many of the current issues influencing agricultural cooperatives in general are affecting tart cherry cooperatives. One such issue that was previously discussed is increased price and income volatility due to reduced government involvement in agriculture. Government involvement in the tart cherry industry decreased substantially upon the cessation of the federal marketing order tart cherry storage program. The storage program helped stabilize grower prices and income by evening out supply fluctuations, and the loss of the program has resulted in more price and income fluctuations. A new federal storage program may be adopted in the future to decrease price and income volatility in the industry.

The trend toward fewer and larger farms is readily apparent in the tart cherry industry. This trend will likely lead to both fewer investor-owned processors and fewer tart cherry processing cooperatives as growers become increasingly able to achieve necessary processing economies of size on an individual basis.

Another trend developing in agricultural cooperatives in general and specifically in the tart cherry industry is toward fewer and larger marketing sector firms. As more growers freeze their own cherries and sellers of frozen cherries become more numerous, and as the buyers of frozen cherries become fewer and larger, the oligopsonistic structure of the frozen cherry market will intensify. Increasing market power imbalance against growers may prompt the formation of additional cooperative bargaining associations to negotiate for frozen cherries. RHC reinforce this possibility, stating: "[C]oordination arrangements which center on the market for processed cherries, rather than on the raw cherry market. . . , will likely become increasingly important in the future" (RHC, p.71).

Finally, cooperative-corporation joint ventures will likely become more common and more important in the tart cherry industry in the future as one way to help stabilize producer prices and incomes (RHC, p.73).

CASE STUDY 2: THE U.S. FARM-RAISED CATFISH INDUSTRY

COOPERATIVES IN THE U.S. FARM-RAISED CATFISH INDUSTRY

Farm-raised catfish is the most important aquaculture product in the United States (Hinote, p.1). The 361 million pounds of catfish produced in 1988, for instance, represented about 45 percent of U.S. aquaculture production (Wineholt, July 1990, p.14). The farm-raised catfish industry has achieved widespread importance in spite of the fact that it is still a very young industry in the United States, having been in existence for less than thirty years (Hinote, p.1). Farm-raised catfish production is geographically concentrated in the southern United States. Mississippi is by far the largest producer. With less than 18 percent of U.S. catfish farmers, Mississippi produces about 80 percent of the nation's output. Mississippi's 91,000 acres of catfish ponds represent 61 percent of the total U.S. pond acreage (Wineholt, July 1990, p.14). In total production, Mississippi is followed by Alabama and Arkansas. Production per acre in the U.S. averages about 4,000 catfish per year (Hinote, p.2). The price of farm-raised catfish is relatively stable throughout the year (Hinote, p.1). Despite this, catfish farming remains a high risk business due to high capital requirements and variables such as weather and disease.

A number of factors make catfish attractive both to producers and consumers. Farm-raised catfish is attractive to consumers because it is available year-round and comes in many different forms. In addition, farm-raised catfish are grown in clean, fresh water and are fed only a commercially prepared diet. Farm-raised catfish do not have a strong fishy odor or taste and they have a longer shelf life than salt water fish. Farm-raised catfish are an economical source of nutritious food; they are high in protein, low in calories, and have no cholesterol (Hinote, p.2-3).

Farm-raised catfish production is attractive to producers for a number of reasons. Man-made catfish breeding ponds present a solution to the current problem of over-harvested natural waters. In addition, catfish are an attractive agricultural crop because they are efficient in converting feed to meat and are suited to intensive culture. Furthermore, catfish ponds and other production

facilities may be established on land that could not be used for other crops (Lee, p.6-7).

Due to these benefits of catfish production and consumption, the farm-raised catfish industry has experienced a period of rapid growth since the mid 1970's. Between 1975 and 1991, catfish production increased more than 2,400 percent (USDA, 1992, p.6). The industry grew at a compounded annual rate of 28 percent during the period 1975 to 1980. For 1980 to 1985, the rate of growth was an even more rapid 33 percent (Hinote, p.1). But after more than a decade of impressive expansion, the catfish industry's growth has stumbled:

In 1990, catfish growers sold over 360 million pounds of catfish to processors. This was an increase of 5 percent from the previous year, but was seen as a slowdown to an industry that had become accustomed to double-digit increases. Over the first half of 1991, the rate of expansion slowed even further as sales to processors rose only 3 percent from the previous year (USDA, 1991, p.10).

The largest limiting factor of catfish production is consumer demand. Presently, the largest catfish consumers by state are Texas, Louisiana, Illinois, Arkansas, and Mississippi. West Coast markets, which are expected to be the fastest growing region for catfish consumption in the future, may help stimulate flagging industry growth rates (Blackledge, p.5).

Primary marketing outlets for farm-raised catfish include specialty catfish restaurants (mainly located in the southern part of the United States), institutional food distributors, retail grocery stores, fish markets, major fish and seafood processors, and chain restaurants (Hinote, p.3).

REASONS FOR COOPERATIVE FORMATION IN THE FARM-RAISED CATFISH INDUSTRY

Market Failures

Cooperatives in the farm-raised catfish industry have been formed out of necessity brought on by adverse market conditions stemming from market failures in the industry. The catfish industry exhibits the primary market failures of all agricultural industries: few buyers, inadequate producer market information, and barriers to market entry and exit.

The ratio of catfish farmer-sellers to processor-buyers is large; although approximately 2,000 catfish farmers operate in the United States, there are only about 30 processors of catfish (Warren). Producers' selling outlets are even more limited on a local basis. In the Alabama catfish industry, for example, only two processors operated in the major production area in 1983. One was sold a year later, creating a monopoly (Sullivan, p.18). The existence of few buyers and many sellers creates an unequal market power relationship that disadvantages catfish farmers when selling to processors.

Another important market failure in the catfish industry is producers' lack of necessary market information. Catfish farmers are at a disadvantage because processors have greater access to timely, accurate market information and use it when buying from individual farmers (Wineholt, Aug. 1990, p.14). Specifically, catfish farmers are lacking information which would help them plan how much to produce. "Continued growth in the production of any agricultural commodity requires a balancing act between growers and processors. For both parties to prosper, production must be in line with processing capacity and also with demand for the finished product" (USDA, 1991, p.10). Producers, however, lack information on both processing and consumer demand for their product. Lacking this information, catfish farmers have not been able to coordinate their supply with market demand, and oversupplies in recent years have resulted (Wineholt, July 1990, p.15).

The third market failure shaping the catfish industry is barriers to market entry and exit. These barriers have primarily been due to large capital requirements:

The capital investment to enter catfish farming is very large. Land cost is about \$800.00 per acre, and it takes \$1,200.00 per acre to construct ponds and put in water wells. The necessary equipment costs about \$500.00 per acre. Thus, fixed costs are around \$2,500.00 per acre. Average operating capital required to produce one acre of catfish is about \$2,000.00 per acre, bringing the total fixed plus operating capital investment to about \$4,500.00 per acre (Hinote, p.1).

These high start-up costs prevent many farmers from entering the farm-raised catfish industry. Large capital investments also create a barrier to exit in the catfish industry. Once land is converted to catfish ponds, the possibility of shifting resources to row crops is eliminated (Wineholt, Aug. 1990, p.14). High capital requirements are exacerbated by the large economies of size inherent in catfish production. In catfish farming, costs decrease and production becomes more efficient as farm size increases. Large economies of size intensify both barriers to entry and exit. Producers must invest more to achieve efficiency and, subsequently, larger investments are more difficult to divest.

Consequences of Market Failures

Market failures in the farm-raised catfish industry have created a number of negative consequences for producers. The most noticeable negative consequence has been low producer prices. Low prices have resulted primarily from oversupplies of catfish, which, in turn, have resulted from a lack of coordination between supply and processor and consumer demand. For example, while production acreage in Mississippi quadrupled between 1977 and 1982, catfish demand did not increase as fast. Overproduction resulted and drove down farm prices for catfish to low levels (Wineholt, July 1990, p.15).

Unfavorable terms of trade have been another consequence of market failures in the catfish industry. The imbalance of market power in the catfish industry, due to the small number of buyers and large number of sellers, has allowed processors to enforce terms of trade that disadvantage producers. Examples of unfavorable producer terms of trade include the "off-flavor" problem and the problem of abundant oversized fish.

"Off-flavor" occurs when catfish absorb flavor compounds produced by pond organisms. The "off-flavor" condition can be very widespread, affecting up

to 45 percent of foodsize catfish held in ponds. Catfish with "off-flavor" are unmarketable; some processors refuse fish with the slightest hint of "off-flavor". Problems for producers arise in the method used to detect "off-flavor":

To date, no instrument has been developed that can quantify the presence or amount of "off-flavor" in a sample of catfish. Instead, processors must rely on individuals trained to detect, by smell or taste, any "off-flavor" in fish prior to delivery to the plant. This subjective testing has presented a number of problems to the industry. Testing can be too severe or too lenient. Strict testing can be construed as a way for a processor to discriminate unfairly when choosing which farmer's fish to accept or not to accept any fish. Lenient testing can be construed as a way for a processor to pay a lower pond price than the more strict processors (Wineholt, July 1990, p.15-16).

Unfair evaluation of "off-flavor" leaves producers with two undesirable outcomes--no market for their product or a low product price. Processors' strict quality requirements can be a legitimate way to preserve retail markets, but in some cases, they can represent an unfair and capricious exercise of superior market power.

Conditions resulting from the presence of abundant oversized fish also have established unfavorable terms of trade for catfish producers. In the catfish industry, processing occurs year-round while the catfish growth cycle tends to produce mature fish that the farmer is ready to market during a 2- to 3- month period (Wineholt, July 1990, p.16). In addition, an informal quota system has arisen which limits the amount of catfish a producer can sell to a processor in a specified period. As a result, during production booms, catfish that cannot be sold are kept in ponds longer, where they eat more and become oversized. Oversized catfish have less consumer acceptability and thus are not wanted by processors. In order to avoid receiving oversized fish from producers, some processors have introduced tiered pricing systems that heavily discount large fish. One economist estimates that tiered pricing systems reduced revenues to producers by at least \$16 million in 1989 (Wineholt, July 1990, p.16). Again, specific product characteristic requirements can be legitimate. If the power structure were reversed, however, and producers had equal or more market power than processors, it is likely that there would be less stringent monthly quotas and discounting of oversized fish.

Another negative consequence of market failures in the farm-raised catfish industry is undependable and inadequate market outlets. Producers can face undependable market outlets because of their small degree of market power. Catfish processors are not apt to be concerned about establishing goodwill with individual producers and thus can afford to be undependable buyers. Inadequate market outlets for catfish production result from a combination of market failures. The presence of few buyers and many sellers, a lack of producer market information leading to an oversupply of catfish flooding the market, and exit barriers preventing catfish farmers from leaving the market all contribute to overabundant catfish competing for inadequate market outlets.

GROWER INSTITUTIONS IN THE FARM-RAISED CATFISH INDUSTRY

In order to cope with the negative consequences of market failure in their industry, catfish farmers have joined together and formed grower institutions. These institutions are designed to aid producers by reducing risk, reducing costs, increasing market power, and increasing grower prices. David Wineholt describes the forms grower-cooperation has taken in the catfish industry:

Through their united efforts, growers have created a substantial presence in the emerging fresh fish industry by organizing a bargaining association, establishing mills to assure quality feed supplies, and forming a processing cooperative through which they can market their production (Wineholt, July 1990, p.14).

Supply Cooperatives

Catfish feed, at 40 percent of production costs, is the major operating cost for catfish producers. Producers' net profits thus are extremely vulnerable to changes in the price of feed; an increase in the price of feed ingredients proportionately increases the cost of producing farm-raised catfish (Hinote, p.1). Supply cooperatives are an effective way of providing producers with stable, low-cost catfish feed. Historically, supply cooperatives, by operating on an at-cost basis, have reduced producers' costs and raised profits:

The first cooperatively owned catfish feed mill, Producers Feed Mill, opened in Isola, MS, in 1974. It provided catfish farmers a steady supply of high quality feed at affordable prices. Dr. Thomas Wellborn, Jr., Mississippi's Cooperative Extension Service, called the mill's opening the single most important event in the development of that State's catfish industry (Wineholt, July 1990, p.14).

Supply cooperatives in the catfish industry also benefit producers by injecting competition into the feed market and by providing better coordination of farmer needs with services provided.

The catfish industry currently has three primary feed manufacturers: Producers Feed Co., Isola, MS; MFC, Madison, MS; and Delta Western, Indianola, MS. Producers Feed Co. and MFC are catfish producer-processor

cooperatives. All three combined produce approximately 90 percent of the catfish feed used in the U.S. (Wineholt, July 1990, p.14-15).

Processing Cooperatives

Processors perform a number of functions in the catfish industry; they procure, clean, and package catfish and distribute catfish products. Processors "appear to offer the best long-run, large-volume outlet for catfish farmers" (Perry and Tilley, p.2).

There are approximately 30 processing firms in the catfish industry, based on a cutoff of the ability to process 2000 pounds of catfish within 8 hours (Harrison). This small number is due, in part, to the major economies of size that exist in large processing plants (Wineholt, July 1990, p.16).

Producer cooperation is very active at the processing level of the catfish industry. The industry's largest processor is a producer cooperative which also performs many marketing functions. Delta Pride Catfish cooperative is the single largest buyer of live catfish with a market share close to 40 percent of all farm-raised catfish sold. The nearest competitors in size are two publicly-owned corporations, ConAgra and Hormel, whose processing operations each has an estimated market share between 20 to 25 percent (Wineholt, July 1990, p.15).

Processing cooperatives benefit their producer-members in many ways, often by counteracting the negative consequences of market failures.

In the catfish industry, conflicts traditionally have arisen between producers and processors. In one "mirror-image" survey designed to compare producers' and processors' opinions on issues of mutual concern, there were a number of areas of conflict. Disagreements occurred regarding pivotal issues such as pricing mechanisms, payment timing, and liability (Sullivan, p.22). Processing cooperatives eliminate conflicts between producers and processors because processing cooperatives' members are producers; the cooperative and its producer-members thus have mutual goals.

Processing cooperatives can also reverse existing market power arrangements which, due to market failure, disadvantage producers. This benefit is described by James C.O. Nyankori:

[T]here have been changes in market conduct whereby catfish farmers, through processing cooperatives, exert a considerable degree of market power through vertical integration of production and processing activities. With a majority share of the market, the producer-cooperative has oligopolistic power in the catfish industry (Nyankori, p.247).

Processing cooperatives can also benefit producers by injecting competition into non-competitive markets. In markets where only one or two processing outlets exist, processing cooperatives may provide an important benefit to producers by creating competition and raising product prices. In this way, processing cooperatives can help producers avoid the negative consequences of the market failure of few buyers.

Improved market coordination is another benefit of producer-processing cooperatives. One example of improved market coordination is the reduction of time between harvest and processing. This is an important consideration for catfish because, like tart cherries, catfish are highly perishable in their unprocessed form. Supply and demand equilibrium is another example of improved market coordination. In one survey, processors' reporting projected catfish volume required by plants was ranked as very important (Sullivan, p.21). Information such as projected processor needs can aid producers in accurately supplying the amount demanded. Since processing cooperatives are made up of producers, coordination of harvest and processing and of supply and demand is facilitated. This coordination helps producers avoid the market failure of insufficient market information.

Processing cooperatives can also play an important role in expanding retail and consumer demand. Processing cooperatives can increase final demand by creating new value-added catfish products for retail markets.

One of the most important benefits of catfish processing cooperatives to their members is their role as guaranteed market outlets for members' products. The attainment of processing market outlets is critical in the catfish industry, in

part because inadequate catfish market outlets are one consequence of market failures. In 1991, catfish production volume rose significantly in Alabama and Mississippi, but fell significantly in Arkansas and Louisiana. Production decline in Arkansas and Louisiana has been attributed to closures of processing plants (USDA, 1992, p.10). Particularly in the face of investor-owned processing plant closures, processing cooperatives offer producers an important outlet for their catfish. In addition, processing cooperatives are less likely to enforce unfavorable terms of trade, such as monthly quotas, than are investor-owned firms.

Processing cooperatives, however, are limited in their ability to help catfish producers. In particular, processing cooperatives cannot economically accept an oversupply of catfish for processing. Like investor-owned processors, processing cooperatives must be large enough to account for future expansion, but small enough to avoid large per unit costs due to excess capacity (USDA, 1991, p.10). These requirements limit the size of cooperative processing plants and their volume capacity. However, because they operate on an at-cost basis, processing cooperatives may be able to maintain slightly higher per unit costs.

Delta Pride Catfish, Inc.

Like most cooperatives, Delta Pride Catfish was formed out of need. Mississippi catfish farmers were overproducing and getting too little for their product, time, and effort (Blackledge, p.4). Delta Pride's 115 original farmer-members joined together because they wanted to control their own economic destiny; they did not want to be at the mercy of large investor-owned processors (Harrison). When it was formed in April 1981, Delta Pride was the first processing and marketing cooperative in the catfish industry (Wineholt, July 1990, p.15).

Since its beginnings, Delta Pride has grown significantly in size and importance. Part of this growth occurred through acquisition of competing processors in the late 1980's. In 1986, Delta Pride, acquired two other major Mississippi processors, Fishland, Inc., and Welfed Catfish; and in 1988, it acquired Grain Fed Fish, Ltd. (Wineholt, July 1990, p.15). These acquisitions helped establish Delta Pride as the single largest buyer of live catfish, with 38 percent of the national catfish market (Harrison).

Today, Delta Pride has 180 farmer-members who collectively control over 50 percent of the available live farm-raised catfish in the world (Delta Pride video script). Members operate large farms, ranging from 200 to 4,000 acres of catfish ponds (Harrison). Each member owns one share of Delta Pride stock for each acre of catfish ponds committed to the cooperative. Each share equals one vote (Blackledge, p.4). The price of Delta Pride shares started at \$150; they are now worth \$1,300. No new shares are currently being issued (Harrison).

Delta Pride has four processing plants that process over four million pounds of catfish a week (Delta Pride brochure). The cooperative's primary plant in Indianola, Mississippi is the largest fresh-water fish processing plant in the world. In addition, Delta Pride also operates a "further-processing" plant (Delta Pride video script). Delta Pride's importance as a processor is illustrated by the fact that several other processors base their prices on Delta Pride's rate (Wineholt, July 1990, p.15).

Delta Pride is operated such that while Delta Pride may buy fish only from its shareholder-members, its members may sell to any processor they wish (Harrison). Delta Pride cannot, however, accept an unlimited amount of its members' catfish: "For Delta, taking on additional business is not a simple matter. It must consider its marketing ability. Frankly, unsold processed fish mean a loss to the cooperative" (Blackledge, p.4).

All the catfish processed by Delta Pride is sold by its marketing division. Delta Pride's marketing division encompasses many activities. Delta Pride marketers design and develop new catfish products and brokers go out in the field and expand retail markets. Delta Pride catfish is then transported to retail markets by the largest company-owned fleet of trucks in the industry. The substantial amount of catfish handled by Delta Pride also works to the cooperative's advantage. It allows the cooperative to better supply its customers from an availability standpoint--a particularly important consideration for food-service customers (Delta Pride video script). One of Delta Pride's brochures emphasizes this benefit: "Of the 90,000 acres of ponds in Mississippi, Delta Pride members own 60,000. It's because of this size that Delta Pride can deliver perfect, great tasting catfish, all year round" (Delta Pride brochure).

Delta Pride seems to have had significant success in the catfish industry. In his article on price transmission in the catfish industry, Nyankori gives a favorable evaluation of the strength and influence of Delta Pride:

Control over production and processing of catfish has given the cooperative a substantial influence in a number of critical areas including price discovery, returns to farmers, and the competitive position of catfish in the market for meats (Nyankori, p.247).

Catfish Bargaining Cooperatives

Bargaining in the farm-raised catfish industry takes place between producers and processors. Catfish bargaining cooperatives can potentially aid producers by helping them avoid the negative effects of two market failures in the catfish industry: the presence of few buyers, leading to a high degree of processor market power, and catfish farmers' lack of market information. Catfish bargaining cooperatives counteract these market failures by increasing producers' market power through group action and by providing their members with timely, accurate market intelligence. The primary aim of catfish bargaining cooperatives, as with all bargaining associations, is to attain the highest price and best terms of trade for their members that can be economically justified.

Bargaining cooperatives need control over a substantial share of the supply of a commodity in order to be effective. The geographical concentration of catfish production facilitates supply-control and thus increases the chances of success for bargaining cooperatives in the catfish industry.

Catfish bargaining initiated with the formation of the Mississippi Catfish Farmers Marketing Association (MCFMA). MCFMA established informal price agreements between processors and its farmer-members, and achieved annual price increases for 7 of the 8 years it operated. Without formal contracts and enforcement powers, however, MCFMA was unable to increase prices further. MCFMA was then reorganized into the Catfish Bargaining Association (Wineholt, Aug. 1990, p.14).

Catfish Bargaining Association (CBA)

The Catfish Bargaining Association was formed in November 1989 in reaction to low producer catfish prices (Allen). CBA started recruiting members by asking catfish farmers to sign a master contract empowering CBA to contract with participating processors to establish uniform prices and terms of trade. By November 1989, "73 percent of the total catfish water acreage on the Mississippi Delta, or about 65,000 acres, was represented by growers who signed the bargaining agreement." In August 1990, CBA represented about 80 percent of catfish acreage in Mississippi (Wineholt, Aug. 1990, p.14).

CBA was also successful in recruiting processors to participate in bargaining. Processors representing more than 90 percent of the catfish industry purchased fish under CBA agreements which set minimum prices to be paid to producers (Wineholt, Aug. 1990, p.16).

In his August 1990 article on catfish bargaining, Wineholt evaluated the success of CBA up to that point:

CBA has had a stabilizing effect on the entire industry. For example, two nonparticipating processors were reportedly paying CBA prices starting in January, while another was paying 5 cents per pound less. Further, after falling for 15 straight months to 64 cents per pound, the average pond-bank price rebounded to 68 cents in November 1989, the month that CBA's first marketing period began (Wineholt, Aug. 1990, p.17).

Wineholt also lists benefits of the Catfish Bargaining Association for other sectors of the catfish industry, such as increases in processor wholesale prices and stable retail prices (Wineholt, Aug. 1990, p.17).

Despite its benefits and apparent success, CBA is not actively bargaining at this point in time. One major cause of this inactivity is apparently a problem with industry free-riders (Harrison).

Wineholt sums up his article by stating:

CBA's formation was triggered by the drop in pond-bank price resulting from production and marketing problems that lately have become more pronounced. With the creation of Producers Feed Mill in the 1970's and Delta

Pride Catfish in the 1980's, cooperative action helped solve production and marketing problems facing catfish farmers at the time. Cooperative action in the form of CBA looks to be a timely next step as the farm-raised catfish industry enters the 1990's (Wineholt, Aug. 1990, p.17).

If CBA is to be the "next step" and play an active role in solving industry problems, it will first have to reorganize and solve its free-rider problem.

COOPERATIVE BENEFITS AND LIMITATIONS IN THE FARM-RAISED CATFISH INDUSTRY

One way cooperatives can benefit catfish producers is by providing otherwise unavailable or inadequate services. For instance, cooperatives have been an important factor in supplementing limited processing capacity in the catfish industry.

Another important benefit of catfish cooperatives is their potential to raise grower net prices, either by increasing gross revenues or decreasing costs. Supply cooperatives have reduced producer costs appreciably by reducing the cost of catfish feed (Wineholt, July 1990, p.14). Producer revenues were increased when the Catfish Bargaining Association increased catfish prices during its period of active bargaining.

As previously mentioned, cooperatives are beneficial when they inject competition into noncompetitive markets. This is a particularly important factor in the catfish industry which is small and localized. The small size and specialty nature of the catfish industry often lead to local monopolies of catfish services. Cooperatives can play an important role in dissolving such monopolies.

The democratic nature of cooperatives can also represent a benefit to catfish farmers who are interested in having more input into different steps of the production process.

Finally, as in all industries, cooperatives in the catfish industry benefit producers by offering better coordination between producer needs and services that are offered. Producer-members of supply, processing, and bargaining cooperatives are unquestionably aware of their own needs and, through cooperatives, are in a position to meet them.

Catfish cooperatives are limited by many of the factors limiting cooperatives in general. Like all cooperatives, a catfish cooperative cannot operate like a cartel by completely controlling supply and fixing prices at a profit-maximizing level. Catfish cooperatives also cannot eliminate the functions performed by middlemen in the production process, even when they are able to eliminate the middlemen themselves.

A particularly important limitation of cooperatives in the catfish industry previously mentioned is their inability to market unlimited amounts of catfish at prices covering production costs. Recent expansion of the catfish industry has led to surplus catfish supplies and declining prices for producers and processors (Sullivan, p.18). Cooperatives' inability to market the increased catfish production is due in part to limited final demand for catfish products. In a January 1987 article, Samuel I. Hinote, the one-time president of Delta Pride Catfish, stated:

The biggest factor which is limiting the growth of catfish farming is markets for the finished product. I believe that if catfish farming remains profitable, markets will be developed and the industry will continue to grow at a rapid rate (Hinote, p.1).

Although catfish production has expanded since 1987 and farmers have continued to increase total revenue, new markets for catfish products have not kept pace (Wineholt, Aug. 1990, p.14).

A 1987 survey conducted by the Alabama Agricultural Experiment Station asked administrators and officials in public agencies serving the aquacultural industry to rate a series of possible constraints or sources of difficulty for the future of Alabama aquaculture. The availability of catfish markets was viewed as a major constraint by 84% of the respondents (Molnar and El-Ghamrini, p.14).

The expansion of markets for catfish products is limited, in turn, by problems that prevent sales of catfish. In a survey that asked retailers and wholesalers to rate problems that prevent additional sales of catfish products, items that received high ratings included consistent supply, quality product, price of product, and consumer demand (Perry and Tilley, p.10). If markets for catfish are to be expanded to provide for increased catfish production, these limiting factors will need to be addressed.

CURRENT FACTORS INFLUENCING COOPERATIVES IN THE FARM-RAISED CATFISH INDUSTRY

Certain emerging factors shaping agricultural cooperatives in general, such as greater price and income volatility due to reduced government involvement in agriculture and fewer and larger marketing sector firms, are not key issues in the catfish industry. The third factor that was identified, however--a trend toward fewer, larger, and more specialized farms--can be found in the catfish industry. Large production economies of size have led to increasing individual catfish farm size in an effort to reduce per-unit production costs (Wineholt, Aug. 1990, p.14). This trend may increase membership in catfish bargaining cooperatives as increased bargaining power through a larger degree of supply-control becomes possible. Unlike the experience of the tart cherry industry, this trend will probably not decrease processing cooperative membership due to large catfish processing economies of size.

The most pressing issue facing catfish cooperatives today is the rapid expansion of the industry and the resulting oversupplies and low producer prices. An important concern of catfish cooperatives is the opening up of new retail markets for catfish through the expansion of final demand for catfish products. In order to achieve market expansion, cooperatives must first address the previously mentioned problems that prevent additional sales of catfish products. One key problem identified by wholesalers and retailers that cooperatives may be able to effectively address is high prices of catfish products.

Nyankori, in his article on price transmission in the catfish industry, concludes that causal relationships exist between farm and wholesale catfish prices (Nyankori, p.247). His analysis indicates that changes in farm level catfish prices directly cause changes in wholesale and retail catfish prices. Hence, one way to lower wholesale and retail prices for catfish products is to lower farm-level catfish prices.

Cooperatives can play an important role in lowering farm-level catfish prices by lowering production costs. If production costs decrease, farmers can afford to lower the price they will accept for their catfish. Cooperatives help producers lower costs by providing additional low-cost and efficient services

through activities such as bulk purchases of production inputs and volume processing.

There is evidence that a drop in farm-level catfish prices, leading to a drop in wholesale and retail prices for catfish products, would indeed increase demand. Janet E. Perry and Daniel S. Tilley suggest this idea in reporting the results of an industry survey:

Comments about price indicate that wholesalers and retailers feel that demand would be stimulated if price could be lowered. Responses from both wholesalers and retailers point to the possibility of catfish products being priced out of the market. These results support prior assertions that the price of catfish is a barrier to greater consumer acceptance (Perry and Tilley, p.11).

This view is further supported by the fact that when catfish prices dropped in 1991, catfish processors' sales rose by more than 9 percent (USDA, 1992, p.7).

Catfish cooperatives thus can potentially be an active part of the solution to insufficient demand for future catfish production levels through their ability to effect farm-level price cuts which can be passed through to the wholesale and retail levels. Cooperatives may also improve retail demand for catfish products through marketing efforts such as promotion and advertising.

SUMMARY

Agricultural cooperatives play a significant role in helping farmers circumvent market failures in agricultural industries. Through cooperatives, agricultural producers are able to join together and effectively solve their own problems. Cooperatives are particularly important for producers in specialty crop industries who often face unfavorable market conditions.

In this paper, economic reasons for cooperative formation and cooperative functions in specialty crop industries were described. Benefits, limitations, and keys to success of specialty crop cooperatives were identified; and future issues that will influence the growth of agricultural cooperatives were discussed. Finally, these issues were applied specifically to two specialty crop industries--the U.S. tart cherry and farm-raised catfish industries.

In assessing the future development of cooperatives in an agricultural industry, it is useful to examine factors in the industry that may prompt further cooperative development, such as market failures and their consequences. Market failures and negative consequences of market failures may lead to further development of cooperatives in specialty crop industries. The path cooperative development has taken in the U.S. tart cherry and farm-raised catfish industries also lends some insight into the possible roles of cooperatives in other specialty crop industries.

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