CHESTNUT GROWER INC.: A CASE STUDY ON THE IMPORTANCE OF SOCIAL CAPITAL IN THE SUCCESS OF ENTREPRENEURIAL VENTURES

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ABSTRACT

CHESTNUT GROWER INC.: A CASE STUDY ON THE IMPORTANCE OF SOCIAL CAPITAL IN THE SUCCESS OF ENTREPRENEURIAL VENTURES

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Entrepreneurial ventures often require the active participation of groups of entrepreneurs or multiple stakeholders to be successful. This is particularly true in the context of nascent agri-food industries. One type of group that is common in agriculture and food industries is that of a cooperative. Cooperatives allow members to pool resources to achieve economies of scale and scope to take advantage of potential market opportunities. However, such cooperatives also face significant barriers, particularly in terms of the coordination of members.

One such cooperative that was formed to exploit a market opportunity is CGI (Chestnut Growers Inc.). This cooperative was formed with the goal of raising awareness of chestnut products to help farmers expand their consumer base and realize higher prices for their chestnuts. Many threats to the group's profitability exist including inherent risk factors such as frost and a lack of full cooperation from group members. Despite these existing risk factors, CGI has the potential to succeed based upon the group members' strong attachment value for the cooperative (and therefore willingness to donate human capital to see the group succeed). Therefore the group members' social capital can be seen as an intangible asset and a source of competitive advantage for the cooperative.

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Section I: Introduction

A cooperative is a user-owned and controlled business that distributes benefits based upon each member's use or patronage (Barton, 1989). Cooperatives have a significant impact on the US economy. A 2009 study by the National Cooperative Business Association and the University of Wisconsin Center for Cooperatives reported that in 2009, nearly 30,000 cooperatives in the US owned over $3T in assets, generated greater than $500B in revenue, distributed over $25B in wages, and claimed 350M cooperative memberships (Deller, Hoyt, Hueth, & Sundaram-Stukel, 2009). Cooperatives are a major component of the US economy, but what differentiates an agricultural cooperative from other types of co-ops?

Agricultural cooperatives can be classified into three general activity categories; marketing cooperatives (which aggregate all of the members outputs, crops, to bargain for better prices through increased volume and the establishment of brand name), farm supply cooperatives (in which farmers pool their resources to achieve economies of scale when purchasing inputs such as seeds and farm equipment), and service cooperatives (which provide services such as storage and crop processing that require relatively large fixed cost investment to establish) (Cropp & Ingalsbe, 1989). Agricultural cooperatives vary in size, but most are relatively small. In 1999, 50% of cooperatives in the US had sales of less than $5 million (Cropp R. , 2002).

Chestnut Growers Inc. (CGI) was established as a marketing cooperative[1], with the goal of collecting chestnuts and selling them under the CGI name. As the group has

[1] Marketing cooperatives can be defined as an organization with a special type of vertical integration, wherein farmers own assets in another tier of the production and

evolved, they have begun undertaking activities similar to a service cooperative. For example, they purchased a chestnut scorer, a fixed asset that required an initial investment of $26,000 dollars through a grant from the Rogers Reserve (see Section I for a more detailed background on the evolution of CGI).

What factors determine a successful agricultural cooperative? Bruynis, et. all (2001) identified six independent variables which affect the probability of success, “sufficient equity before start up, maintaining an adequate business volume, keeping and distributing accurate financial records, importance of previous cooperative experience and continued management training for both the board and manager, and marketing agreements.” (14). CGI is currently taking actions to address each of these factors. For example, they are actively seeking marketing agreements with large customers to help maintain adequate business volume. Even though they can interest buyers in their potential chestnut crop, they do not have enough member participation (in the form of chestnuts sold by members to the cooperative) to meet the potential demand.

Another way to explain the fundamental issue that CGI faces is to look at how one member’s actions affect the cooperative, and in turn affects all other members. This can be best described by the cumulative causation concept defined by Schmid (1999), “a relationship between an initial change in an independent variable and the dependent variable, whereby the dependent variable in turn causes a change in the formerly independent variable in the same direction as the initial movement” (Schmid, 1999). In our case, the choice variable for farmers is the percentage of their crop that they give to

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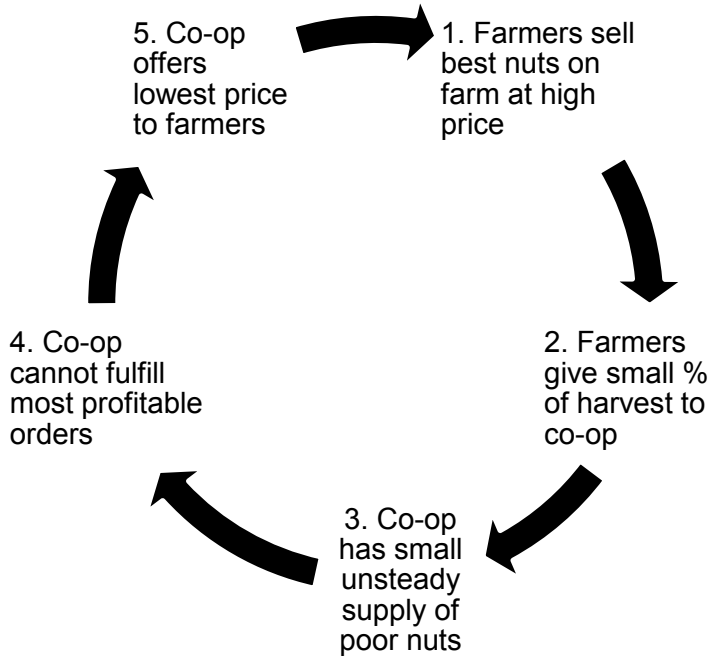
distribution system. For a further exploration of this topic see Cook 1995, Hendrikse and Bijman 2002.

the co-op. Ideally, this choice variable is most significantly affected by the price they receive from the co-op. However, the co-op currently offers lower prices than other market outlets as they don't have the volume to fulfill the more profitable orders. Therefore in the next harvest season, the farmer gives the co-op their leftover poor quality nuts. And the cycle continues. This feedback cycle inhibits the growth of the cooperative (see Figure 1.1).

Figure 1.1: Circular Causation of CGI



However, this description does not fully explain the behavior of all cooperative members. Such as, why do certain farmers sell their entire crop to the co-op despite receiving a lower price than available elsewhere? We will explore this question through the application of two separate schools of thought – social capital and organizational identity.

Purpose of Study

The purpose of this thesis paper is to explore the issue of social capita, attachment value for the cooperative, and organizational identity as it applies to a case study of Michigan chestnut farmers involved in the cooperative Chestnut Growers Inc. The central question that we are trying to address is: How does an individual's affiliation level with the cooperative affect their participation level and in turn the performance (profitability) of the cooperative. By addressing this question, we can examine whether cooperatives and other non-corporate organizations need social capital to survive and flourish.

What follows is divided into five sections. The first section of this paper provides a snapshot of our case study, Chestnut Growers Inc. The second section reviews relevant literature including cooperatives, social capital, attachment value theory, and organizational identity theory. The third section will explore the multi-method research approach, discussing the merits of the case study research method and how qualitative data such as interviews and surveys can help enrich our case study. The fourth section describes the results of our qualitative data collection and applies preliminary connections between the literature and the actual case study. The fifth section summarizes important conclusions and provides guidance for further development of the subject.

Section II: Snapshot of Case

Chestnut Industry Background

The Midwest chestnut industry is still in its relative infancy. Volume of production is low – in a 2004 national survey, 80% reported less than $5,000 in annual sales for producers. Also, most chestnut producers have been in business less than fifteen years and are just now starting to produce commercially (Gold, Cernusca, & Godsey, Chestnut Market Analysis: Producers' Perspective, 2006). Chestnut consumption is also relatively nonexistent in the U.S. – consumers in the U.S. eat only 0.1 lbs. of chestnuts per capita. Europeans eat approximately 1 lbs. per capita and Koreans are the world's largest consumers at 4 lbs. per capita (Bodet, 2001). To provide a background on the chestnut industry as a whole, we will first discuss the national chestnut industry and consumer preferences regarding chestnuts. The most comprehensive resource for information on the national chestnut market is the work by the University of Missouri Center for Agroforestry which we can compare to our own data which we gathered from surveying and interviewing individuals in Chestnut Growers Inc.

From a national survey of chestnut growers (Gold, Cernusca, & Godsey, Chestnut Market Analysis: Producers' Perspective, 2006), we can present a portrait of the U.S. chestnut industry: Current production volume is estimated at less than 1.5 million pounds nationwide. National chestnut production is so insignificant that it is not even included in the United States Department of Agriculture's annual "Noncitrus Fruits and Nuts" report (USDA, 2011). U.S. chestnut producers are mainly part-timers or hobbyists where only 20% of respondents are full time farmers. Orchard operations are small, with 76% of respondents reporting orchards of less than 10 acres. Commercial

production (i.e. at least 10lbs./tree) can be reached in six to nine years with 50 trees per acre and under appropriate management.

One important factor affecting industry profitability not discussed above is frost. Frost is an extremely important risk factor for most CGI members as it literally knocks out years of viable chestnut crops. Therefore costly preventative actions must be undertaken to limit the impact of frost on the farmer's crops. This issue will be explored further in Section III.

Through a longitudinal study (Aguilar, Cernusca, & Gold, 2009) performed annually at the Missouri Chestnut Roast festival, we are able to begin to understand consumer preferences regarding chestnuts: Quality, locally grown and nutrition concerns were consistently the most important attributes influencing chestnut purchasing decisions. Consumers prefer local U.S. grown chestnuts to imports, organically certified chestnuts, and medium sized chestnuts. Growers that provide chestnuts that meet these three characteristics are able to capture price premiums for their products. Over the five year time period, repeated exposure to chestnuts by Missouri Chestnut Roast festival visitors increased their interest and in turn consumption of chestnuts.

So how does the snapshot of the national chestnut industry provided by the Missouri dataset compare to the Michigan chestnut industry? To explore this question, we must look at Chestnut Growers Inc. to understand their view of the chestnut industry.

Michigan Chestnut Industry: A History of Chestnut Growers Inc.

Chestnut Growers Inc. (CGI) is a cooperative located in Southwest Michigan. CGI was established in 2000 with roughly 20 members and has now grown to over 40

members. The members are a very diverse group, with individuals owning varying sizes of chestnut orchards which were established at different points in time, and some farmers not performing the daily operations of the farm. Although membership has grown and expanded beyond Michigan to members in Washington and Iowa, active participants are less than half the group total. Active participants are measured as individuals who regularly give part of their chestnut crop to the cooperative.

CGI was not the first chestnut venture in Michigan. A few of CGI's founders first belonged to a group established over 30 years ago, the Chestnut Alliance. An interview with a Michigan chestnut expert helped shed light on this early chestnut organization:

> *"The chestnut Alliance arose out of a "get rich quick" mentality perpetuated by a chestnut seedling salesman who sold a group of farmers the dream that they could turn a quick profit by planting chestnuts. This group grew a diverse number of cheap seedlings based upon the model of three or four orchards planted in around the middle of the 20th century in southern Ohio. However the land they planted on was not on the same parallel (thus different microclimate) and was also cheap, worn out land. These individuals were hobbyists trying to quickly become commercial farmers and they ultimately failed miserably as chestnut blight and the low quality of the seedlings lead to a success rate of only 25 out of every 500 planted trees" (personal correspondence, 02/07/2011).*

Out of the ashes of this first group arose a few farmers that still wanted to pursue chestnuts as a viable, long-term crop. These individuals came together to create Chestnut Growers Inc.

Despite the best intentions of these pioneers, the very nature of chestnuts does not lend itself to instant profitability as; 1) there is a significant lag time (between 5-10 years) between planting and when the tree begins to bear fruit, and 2) chestnuts are a relatively unknown crop to the Michigan microclimate and the American consumer.

Chestnuts have been cultivated for thousands of years as a staple part of the diet of populations in western Asia and southern Europe. They are native to moist temperate regions of the northern hemisphere (Miller, 2003). The American chestnut was once a major tree species along the Appalachians, until chestnut blight (from an imported fungus) caused their near extinction in the beginning of the 20th century (Anagnostakis, 1987). Despite the abundance of this plant, chestnut trees were used mainly for its high quality wood, not as a row crop. American chestnuts are typically the sweetest and therefore the most preferred by consumers (Gold & Cernusca, Consumer Preferences for Chestnuts, Eastern Black Walnuts, and Pecans, 2004). In response to chestnut blight, new hybrids are being tested to determine the ideal genotype for the Michigan microclimate. Chinese chestnuts are the most resistant to chestnut blight, but this trait is highly variable and the nuts are of smaller size and are less sweet. As such, according to an industry expert with experience working with CGI (personal communication, February 7, 2011), CGI members are transitioning from Chinese seedlings to Colossal cultivars, a hybrid of European-Japanese descent. This experimentation is one of the main factors impeding profitability for CGI. The process of establishing the ideal genotype for the Michigan climate takes years of trial and error. For reference, it took thousands of years to establish the best apple cultivars and apple harvesting methods.

CGI recently established marketing connections to help raise awareness of their product and introduce chestnuts to new markets. For example they frequent the annual “Meet the Buyers” conference, a get-together of producers and buyers of the Great Lakes region. CGI spent $15,000 to receive a $100,000 grant from the Michigan Department of Agriculture to use towards the creation of value-added products. This

money was first used to hire an agri-business consultant with expertise in grocery store supply chains, who emphasized the development of a new value-added chestnut product, sliced chestnuts. With funds from the Rogers Reserve, CGI purchased a chestnut-slicer for $26,000 for this purpose.

However, the market for this value-added product has been slow to develop and as a result the CGI membership has become divided. This point was emphasized during a visit to the orchard of one of the current board members of CGI, where the interviewee brought out dozens of boxes filled with bags of unsold chestnut slices. They had used their new slicing machine to create a new value-added product. Although the technical knowledge and equipment exists to create value-added products, but the market has yet to be established for these products. Because of this failed business experiment, much of the group doubts the profitability of value-added ventures and prefers to carry-on the “tried and true” method of collecting nuts, finding an outlet for fresh chestnuts, and distributing the resulting profits amongst the members.

Essentially, the current co-op members believe they are guinea pigs (term used on many occasions by both co-op members and experts in describing their role in the evolution of CGI). Because they all started their orchards at different points in time, used a diverse set of seedlings/cultivars and employed a variety of different growing methods, no optimal growing, harvesting and marketing methods have been established. As revealed by interviews with industry experts and growers, there is a shared belief that CGI should ideally start with a new group of growers employing the same methods and using the same cultivars. The lack of clear profitability from their chestnut orchards has led to tension arising within the group at their frustration with a

crop they originally perceived as a quick profit opportunity. This tension is compounded by the group's diverse motivations, as some members see chestnuts as a retirement hobby while others seek to treat chestnuts as a commercial crop (see results of the initial survey in Section III). Essentially, the first group farms simply because they have land and are experimental, they are willing to do anything regardless of cost because farming is a passion and not a primary source of income. While the second group thinks more economically, as they want to know the full financial costs upfront (personal communication with self-identified commercial farmer, March 3, 2011). Therefore for this group to succeed economically, these different motivations need to be reconciled.

These differing motivations will be further explored through qualitative research methods discussed in Section III, as we seek to address how the characteristics of each individual co-op member affects their participation within the group and in turn the performance of the cooperative. The next section provides a background on the theory that we will apply to our specific case study.

Section III: Literature Review

Cooperatives

Chestnut Growers Inc. (CGI) is an agricultural cooperative. As an agricultural cooperative, CGI fits the description of Cook & Plunket's collective entrepreneurship (2006), wherein CGI is a formal group of individuals seeking profitable returns for its members by combining, "the institutional frameworks of investor-driven shareholders firms and patronage driven forms of collective action (421)."

Agricultural cooperatives emerge in situations where problems of asymmetric information between suppliers and customers, problems of publicness (i.e. nonrivalry or nonexcludability), or both exist. Traditionally, co-ops adopted defensive strategies and organizational structures which arose to counter the extraction of monopoly rents[2] by input suppliers or customers. Cooperatives were created to ensure that the farmers were on both sides of the transaction, to reduce their costs and lock-in their on-farm returns (a form of real options[3] in a sense).

Recent studies on agricultural cooperatives (Hendrikse, 1998) and (Hendrikse & Bijman, 2002) highlight incentive alignment challenges regarding, "residual distribution and risk capital accumulation". The new studies suggest that we expect to see new organizational structures emerge to address these market failures. These organizations

[2] Economic rents are distinguished into three types; Ricardian, Pareto, and Monopoly rent. In this case we are referring to Ricardian rents which are defined as returns from a quasi-fixed asset that are in excess of the cost required to maintain that asset (Jacobsen, 1988).

[3] The pertinent real option in a defensive co-op is the value of the follow-on investment opportunities at the farm level. As Cook & Plunkett (2006) describe, "A defensive cooperative investment could be thought of as a call option, in that the value of a successful initial cooperative investment could underpin a much larger payoff from subsequent investment at the farm level." A low return at the co-op level could be counterbalanced by a high expected on-farm return.

are best described by both Merret & Walzer's (2001) work on New Generation Cooperatives (wherein new cooperatives adopt a more liquid property rights structure) and Chaddad & Cook (2004) who develop a property rights-based taxonomy of seven emerging cooperative organizational models. New Generation Cooperatives have, "a more clearly defined membership policy (closed or well-defined), a secondary market for members' residual claims, patronage and residual claimant status restrictions, and enforceable member pre-commitment mechanism. This is in contrast to traditional co-ops, whose property rights structure is characterized by open membership, capital generated through earnings from patronage, and illiquid ownership rights." (Cook & Plunkett, 2006, p. 424). CGI was initially established as a marketing cooperative in the traditional agricultural cooperative model. In response to a lack of consistent member participation, they set about instituting enforceable commitment rules requiring members to sell a fixed percentage of their harvest to the cooperative. As such, CGI is transitioning from a traditional cooperative to a New Generation Cooperative to address this market failure (lack of member participation).

The evolution of traditional single-commodity cooperatives mirrors the development of CGI wherein they, "started as minimally capital-intensive bargaining cooperatives and then evolved into marketing/processing cooperatives attempting to bypass investor-owned firms to avoid monopsonistic rent extraction. Over time, these cooperatives acquired processing and distribution facilities and invested in intangible assets such as brand names. They sought to leverage their defensive reason for formation into offensive rent extraction." (Cook & Plunket, 2006, p. 425). Chestnuts Growers Inc. is a single commodity cooperative that is attempting to establish a brand

name so that they can extract higher rent (i.e. receive higher payment for their chestnuts than they could receive selling individually on the farm or at the local farmers market).

The concept of collective action, as developed by Cook & Plunket, can be further explored by understanding the literature surrounding organizational identity. The evolution, maintenance, and projection of an organization's identity is vital to understanding the success of a particular group. Collective action is the term used to describe the acts which define what exactly an organization is, in other words, their organizational identity.

Organizational Identity

In his original works on organizational identity, Albert (1977) combines the theory of the identity interaction model and the works of the development psychologist Erickson (1968) on identity formation as a series of comparisons. This leads directly to Albert's initial definition of organizational identity which is formed by a process of "ordered inter-organizational comparisons and reflections upon them over time." (Albert & Whetten, 1985, p.98).

Later, in their seminal article in 1985, Albert and Whetten set about establishing their definitive definition of organizational identity. This version defines organizational identity as those characteristics which are central, distinctive and enduring (Albert & Whetten, 1985). These characteristics were tweaked in Whetten's later work (2006) which provides a stronger version of the original piece and aligns the organizational identity concept as an analogue to individual identity. Whetten proposes that the true theory of organizational identity is defined as the "central and enduring attributes of an

organization that distinguish it from other organizations." (219). These attributes are referred to as *organizational identity claims* which are actions that the group must undertake to maintain their established identity. It is important to distinguish between the identity of collective action (organizational identity) and the identity of a collection of actors[4]. This differentiation is explored in various works which posit that modern society treats organizations as if they were individuals[5] and therefore grants them the same rights and responsibilities as collective social actors (i.e. individuals), see (Coleman, 1974) and (Zuckerman, 1999). CGI is an organization, and as such is composed of a collection of individuals. Each individual has their own motivations and actions (e.g. decide to plant seedlings rather than grafting chestnuts) and this aggregate is considered the identity of a collection of actors. However, actions performed under the CGI banner (e.g. group of farmers promoting CGI chestnuts at a local farmers market) are what define the identity of the organization – the identity of collective action.

Identity as a classification leads to two issues: distinguishing between public and private identity and how that identity is conveyed to others. This leads Whetten (2006) to three hypotheses; greater the discrepancy between the insiders and outsiders view of the organization the more the "health" of the organization will be impaired, publically

[4] The beginnings of social capital are shared kernels of commonality (Robison, Schmid, & Siles, 2002). By exploring the common identity claims amongst members to establish a group identity, we can begin to see how the concepts of social capital and organizational identity complement each other.

[5] For a more current example see the 2010 Supreme Court ruling in Citizens United v. Federal Election Commission which advanced the debate on corporate personhood. They ruled that corporate political spending was protected under the First Amendment, and thus corporations have protections under the First Amendment and therefore are "persons".

presented identity will typically be more positive, and a more monolithic than internally perceived identity will be presented.

Ultimately, Whetten (2006) advances the notion that analyzing and composing an organizational identity is a last measure, when other explanations won't do. Since this process is both mentally and socially exhausting requiring much group introspection, organizations only attempt to address the identity question when easier avenues have been exhausted and will only provide as minimally sufficient an answer as possible.

The question of organizational identity is especially salient during particular life cycle events, most notably, in the formation of the organization. Strong identities that are simple, clear, and unanimous are frequently associated with successful startup ventures (Hogg & Terry, 2000). Other advantages of a unitary identity include; creates a sense of unity that can help drive future success (Castanias & Helfat, 1991) and can encourage group members to resolve issues that threaten the established identity (Dutton, Dukerich, & Harquail, 1994). However, a unitary organizational identity can inhibit organizational actions, interpretations, and potential for change (Pratt & Foreman, 2000). Therefore a strong identity can be both a liability and an asset when an organization is faced with fundamental change. A stable organizational identity (centered around a few core values rather than repeated behaviors) that is able to dynamically adjust in response to continually changing external variables can be a source of multiple temporary advantages (Fiol, 2001). Thus for CGI to properly evolve from a loose agreement between fellow chestnut farmers to a collective entrepreneurship venture, they must maintain clear values to establish a strong yet flexible organizational identity.

It is important to note that with collective action "… unless the number of individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not act to achieve their common or group interests*" (Olson, 1965, p. 2). Therefore if the group's common interest is to make money for members, why does the participation rate vary so much between members when the current financial returns are so low? We hypothesize that different members are motivated by different incentives (identity of a collection of actors) which results in a muddled identity of collective action (organizational identity). One explanation for this phenomenon could be social capital – different members have varying levels of attachment value with the group and therefore participate according to their level of social capital. To properly understand this concept, we must first explore what social capital is and the evolution of social capital theory.

Social Capital

Neoclassical economic thought posits that humans act perfectly rational and base their decisions solely upon maximizing their utility through the allocation of scarce resources[6]. This is referred to as the selfishness of preferences assumption by Quirk and Saposnik (1968). By this logic, in any economic transaction each individual acts only in his own (selfish) interest. Violations of this principle are commonly observed[7]. For example, when analyzing the transactions of farmland sales, researchers discovered that farmland sellers provide a discount to family and friends while requiring

[6] See Colander's (2000) declaration of *The Death of Neoclassical Economics* for a thorough review of the history and development of the term "neoclassical" and why that term does not accurately describe modern economic theory.
[7] Robison's early work in his article *In Search of Social Capital* (1996) provides a succinct overview with different examples of how relationships alter economic behaviors.

a higher price for unfriendly neighbors. In this specific example, just 33% of the person's motivations can be fully explained by neoclassical economic thought (i.e. solely maximizing selling price) (Robison, Myers, & Siles, 2002). Therefore there must an unknown factor that would explain the other two-thirds of the individual's motivations. We believe that this anomaly can best be described by the term social capital, more pointedly an individual's sympathy for another.

Another study measured the relative importance of motives through both hypothetical surveys and non-hypothetical experiments. They found that social capital motives allowed a subject's well-being to be affected by his sympathetic relationship with others. Therefore the central assumption that selfishness explains nearly all of resource allocation decisions can be rejected (Robison, Shupp, Jin, Siles, & Ferrainni, 2012).

The concept of sympathy in economic terms was first discussed as far back as Adam Smith (1759, p. 3) who wrote in *The Theory of Moral Sentiments*:

> *"How selfish soever man may be supposed, there are evidently some principles in his nature, which invest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it"*

This inherently makes sense, as in life, we are not merely purely rational robots who constantly compute differential equations to maximize our utility. No, we are human beings driven by a complex, ever-changing combination of emotions, logic, and a drive to achieve a sense of belonging. Think of the last time you helped your neighbor or visited your favorite coffee shop. You performed these activities not because you were financially compensated for helping your neighbor move or paying a cheaper price for coffee, it was because you internalized the well-being of your neighbor or associated an

attachment value[8] to your favorite coffee and were willing to pay a little more for the familiarity. This phenomenon can best be described by the term social capital.

So what exactly is social capital? With many different definitions floating around in academic literature that attempt to encompass what social capital is, where it resides, and how it can be changed, it is important to establish a definitive definition. For our purposes, we will use the definition advanced by Robison, Schmid, and Siles (2002):

> *"Social capital is a person's or group's sympathy toward another person or group that may produce a potential benefit, advantage, and preferential treatment for another person or group of persons beyond that expected in an exchange relationship."* (Robison, Schmid, & Siles, 2002).

Social capital can produce socio-emotional goods, while other forms of capital can produce physical goods and services. Socio-emotional goods are, "expressed emotions between persons that validate, express caring, or provide information that increase self-awareness and self-regard." (Robison & Flora, 2003, p. 1188). Essentially, socio-emotional goods make a person feel good inside. This idea touches on Maslow's hierarchy of needs (1962), with socio-emotional goods fitting under the love/belonging and esteem needs – all of which fall under the most basic level of human needs. Because socio-emotional goods are exchanged in nearly every interpersonal interaction, it is pertinent to understand how socio-emotional goods add or subtract

[8] Attachment value is the change in value of a good/service above and beyond the economic cost. These are goods that are embedded with socio-emotional goods. For example, a picture of your family vacation to the Grand Canyon is embedded with socio-emotional goods for you (brings back happy memories and reminds you of your youth). This picture is worth more to you (and you would be willing to financially pay more for it) than a stranger because they have no attachment value with the picture. See Robison and Ritchie's *Relationship Economics* (2010) for a deeper exploration.

value from a transaction. In our case, we will analyze whether socio-emotional goods add or subtract value in the economic exchanges between the cooperative and its individual members.

In our data collection we are not setting out to explicitly measure social capital. Rather, we are attempting to discern whether the difference in participation rate (percent of individual farmer's harvest sold to co-op) is influenced by social capital and the exchange of socio-emotional goods. Similar to Robison and Flora's (2003) proposal, we can use the difference in participation rate as an indirect measure of social capital's influence. We can then cross-check this explicit measure with their general level of sympathy for the group (established through a series of hypothetical questions regarding their attachment and association levels with the cooperative and group members). Thus, through our two data collection methods, we will attempt to ascertain whether an individual's sympathy level for the group can help explain their participation level in the group.

The next section will address how we established the story around our data and the data gathering methods. Namely, it will discuss the methods we used to best create a rich background upon which we can test our social capital and organizational identity theory.

Section IV: Research Methodology

This study utilizes the case study methodology to examine the effects of organizational identity and social capital on organizational performance within the context of an emerging agri-food co-operative, Chestnut Growers, Inc. Case studies are common in social science research as they are a robust tool that allows the researcher to "retain the holistic and meaningful characteristics of real life events" (Yin, 2003; Eisenhardt, 1989; Hamel, 1992). The case study approach is the optimal research strategy for our study given that we will analyze a single phenomenon within its current environment and since contextual conditions are extremely pertinent for our study. Furthermore, given the nature of this study, it is difficult to dissociate the true level of attachment value each co-op member has for the group. This study will use a multi-method qualitative approach (i.e. survey, interview) to collect and analyze data for the case study.

The Case Study Research Method

Case studies are defined as a comprehensive research strategy which includes the logic of design, techniques of data collection and the explicit approaches to data analysis (Yin, 2003). Yin expounds upon this definition to add two sections to the technical definition of the case study as a research strategy:

1. A case study is an empirical inquiry that explores a current phenomenon within its real-life context (i.e. not a controlled experiment) and is especially appropriate when the boundaries between the context and phenomenon are not clearly defined.

2. The case study research method copes with the difficult situation where there are less data points than variables of interest by both relying on multiple sources of evidence and using previous theory development to help guide data collection.

Both parts of Yin's technical definition of a case study apply directly to our situation. First, the contextual conditions are extremely pertinent for our study, as it is extremely difficult to dissociate the true level of social capital each group member has for the group. The very nature of the research problem is undefined and unexplored. The chestnut industry is still in a nascent stage of development without profitable, well-established harvesting methods, distribution channels or inputs (i.e. cultivars) optimized to grow the highest quality chestnut trees in the Michigan microclimate. The unit of analysis for the case study is Chestnut Growers Inc., which is a relatively new cooperative organization that was established ten years ago. As with many nascent organizations, the cooperative continues to struggle to define both its identity and purpose. Thus, for our research situation, "boundaries between the context and phenomenon are not truly defined." The second part of Yin's definition touches upon the lack of comprehensive available data and the flexibility and creativity that the case study method allows to help address our research question. Our original single data point is CGI, a nascent cooperative struggling with profitability operating in an underdeveloped market. Next we use multiple sources of evidence, particularly surveys and interviews, to provide additional data points to help frame our case study. To bring all of these observations together towards a logical conclusion, previous theory development (i.e. social capital and group identity) is used to provide a concrete conclusion to our original

hypothesis. Thus our research situation meets both criteria for the case study research method.

In this situation a case study must be undertaken because of nature of the issue being explored. The case study research method has strengths in dealing with multiple forms of evidence. Using the COSMOS research design table developed by Yin (COSMOS corp.), case studies have a distinct advantage when it; a) addresses the how and why of the research question, b) requires no control of behavioral events, and c) focuses on contemporary events. Our study focuses on contemporary events which cannot be controlled in an experiment. We are attempting to analyze a living group and understand individuals' perceptions and how these perceptions effect their actions within the group. We are trying to understand both the why (why do participation levels vary among group members?) and the how (how are group members' attachment value with the cooperative constructed/changed?). Therefore the case study research method is most appropriate in addressing our central research question.

As with any scientific study, we need to gather data to address our research question. The inherent benefit of the case study research method is that the data both shapes, informs and guides the research. In other words, an exploratory case study (Yin, 2003). By beginning with a concrete research question, we can use different primary data gathering methods to inform the case. Because the topic is so underdeveloped, the best method for gathering data would be performing surveys and interviews to establish a framework to guide our research.

Survey

The survey was administered to 46 chestnut farmers associated with CGI. This was our target population, which includes all of the current and former members of CGI. We received a response rate of 70% as 32 individuals responded. The survey was pre-tested with 12 group members who attended the annual cooperative meeting in April 2009. This meeting is held once a year to discuss co-op business, learn new chestnut research results and elect new board members. The topic of participation (and the lack thereof) will be further explored in Section V. To ensure maximum participation among the co-op members, a survey package was put together and mailed to the remaining group members. A cover letter[9] was attached, informing participants of the purpose of the research and importance of their participation.

This initial survey helped shape and inform the case study. The analysis of the survey results was the first attempt to outline the basic characteristics of the Michigan chestnut industry and Chestnut Growers Inc. as an organization. The survey covered basic demographics, production and marketing methods, and most importantly attitudes regarding cooperatives and CGI specifically. A summary of this report is as follows: 1) *chestnut orchards were found to be only minimally profitable at the time of the study, 2),as operation size increases the potential for achieving healthy profit margins exists (20%), 3) CGI group members identify strongly with the organization, but their actions do not appear support their positive perceptions of the organization (i.e. co-op participation was low), finally 4) the combination of inherent risk factors in chestnut production (frost) and a lack of a consistent supply of quality nuts to the co-op threaten*

[9] See Appendix Exhibit A.3

the growth and future profitability potential of CGI. Please see Appendix Exhibits A.1 and A.2 to review the initial survey and for a full report of the survey results.

Given this initial analysis, we structured follow-up interviews with CGI members to further inform our case study and to address our original research question.

Interviews

At the end of the initial survey, we asked respondents to indicate whether they would be interested in participating further in the study through interviews or group discussions. Half of the respondents (16/32) indicated their acceptance and from this list we selected a sample of 10 farmers for interviews using expert opinion to get geographic, demographic and group status diversity. First a letter was sent to each of the 10 selected farmers and email follow-ups were conducted to coordinate individual interview times.

It was emphasized at the outset of each survey that all results were confidential, no one within CGI would learn of their individual responses and that there were no correct answers to any questions, we merely wanted to garner their opinions. The survey was divided into four main sections. The first section verified previous demographic questions to establish a baseline of their participation level (i.e. how much of their harvest they gave to the co-op). The second section explored social capital incentives, starting with their specific relationships with other cooperative members and then transitioned to a set of hypothetical questions to determine the consistency of their actual behavior (associating with co-op members outside of business transactions) with their perceived level of social capital (offer to give a co-op member a ride to the next meeting). The third section asked respondents about economic incentives such as

prices and access to equipment and how these factors would affect their behavior. Finally, the fourth section garnered the respondents' overall impression of CGI as an organization and what they perceived the goal/mission of CGI to be.

The interview questions were composed of both quantitative and qualitative questions (see Appendix Exhibit A.4 for the interview protocol used). Where possible, closed-ended questions were crafted to increase the ease of comparability between subjects (Dillman, Smyth, & Christian, 2009). By requiring participants to give a specific answer (either along a seven point Likert[10] scale or by limiting responses to a range of specific choices), we can limit participant's responses and more easily compare them to other participants. However, much of the nature of our research relies on qualitative observations, which can only be addressed through open-ended questions. Therefore questions regarding feelings, perceptions and opinions utilized this format.

We are studying a single phenomenon without any scientific controls and limited data points to address newly developed theory. The research and data gathering process informs the case study which is constantly evolving. Both a survey and interviews were undertaken to shape the case study, and both of these tools were influenced by our previous exploration of social capital and group identity theory. To maintain the direction and integrity of the case study, all research was conducted under the overarching theme of our research question. Because of the nature of our study, a case study is the most appropriate research method to address the varying participation levels and underlying profitability drivers of the cooperative Chestnut Growers Inc.

[10] The Likert scale was first proposed in 1932 as a summated scale for the assessment of survey respondent's attitudes (Likert, 1932) With a Likert scale, we are attempting to measure the underlying/latent continuous variable who value drives a respondent's general attitudes and opinions (Clason & Dormondy, 1994).

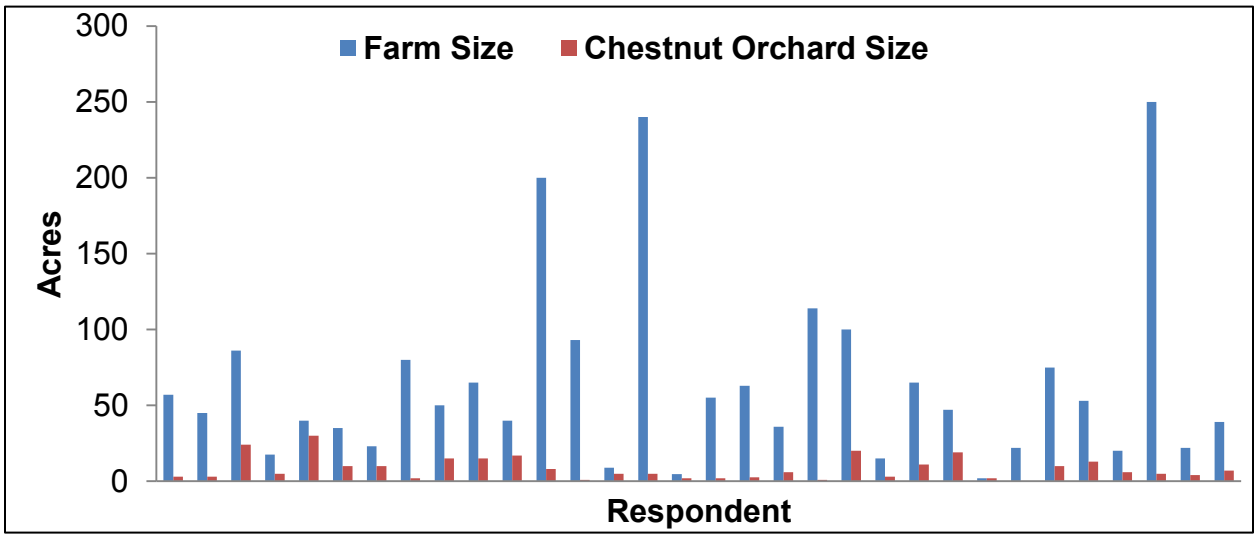
Section V: Qualitative Methods Results

Survey Results

Our first data collection method was an exploratory survey of the CGI membership. This was chosen to help provide general background information about the group so that we could determine which topics were important for further exploration in subsequent research activities.

In this initial survey, we received a response rate of 70% as 32 of the 40 cooperative members responded. All of the farmers were from Michigan with the exception of one respondent; this member did not ship their chestnuts to CGI. The average farm size is a total of 64 acres but most farms are within the lower end of this average. The average percentage of the farm that is dedicated to chestnut production is 24% with a mean of 8.60 acres. Figure 5.1 compares the size of the entire farm to each farm's chestnut operation, in acres. As shown below, the smaller hobby/retirement operations have a much larger portion of their farm dedicated to chestnut production. Larger farms use a smaller percentage of the farm for chestnuts because they mainly see chestnuts as a way to diversify and decrease their exposure to a single crop.

Figure 5.1: Farm Size vs. Chestnut Orchard Size



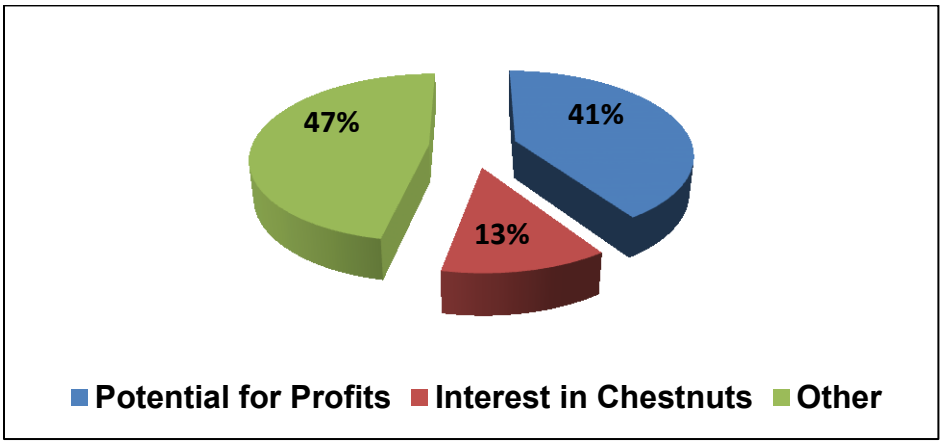
Note: For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this thesis.

Farming is not the primary source of income for most survey respondents; 88% of farmers stated 0-10% of household income is generated from their farm. Possible explanations for this could be that farmers are harvesting chestnuts as a retirement hobby or that many chestnut orchards are still maturing, have yet to reach yield capacity, and are therefore not currently turning a profit.

There are two different age cohorts of chestnut farmers, as farmers either started their chestnut orchards 5-8 years or 15 plus years ago. Respondents cited different reasons for establishing a chestnut orchard. Farmers were initially attracted because of the potential for profit (40%), alternate source of retirement income, and as a low maintenance or unique/interesting crop. One additional significant reason is that 12.5% of respondents purchased land with pre-established chestnut trees. Figure 5.2 outlines their motivations for establishing an orchard. Respondents are extremely bullish regarding their chestnut operations as 72% anticipate expanding their chestnut orchard

within the next five years; 25% will maintain the same size chestnut operation, while only one respondent anticipates decreasing the size of their chestnut operation. This optimism is also directly reflected in responses to questions related to their financial situations, where 86% of respondents expect chestnut prices to rise within the next five years.

Figure 5.2: Initial Attraction to Chestnuts



When asked about explicit risk factors deterring more chestnut producers from entry into this industry, a lack of resources was not deemed to be a pertinent issue. Rather, almost all respondents cited a general lack of knowledge about chestnut production or uncertainty of the chestnut market. Other alternate explanations that were cited included: “Lack of profitability”, “Lack of economic analysis”, the age of farmers or hobby/retirement farming, frost and other difficulties in keeping trees alive, and no mechanization which requires a high amount of labor input.

Table 5.1 details the actual outlets through which farmer sell their chestnuts. As shown in the table, most farmers sell to CGI and direct-to-consumers on the farm. The highest average prices received, however, are from farmers markets and online direct-to-customers.

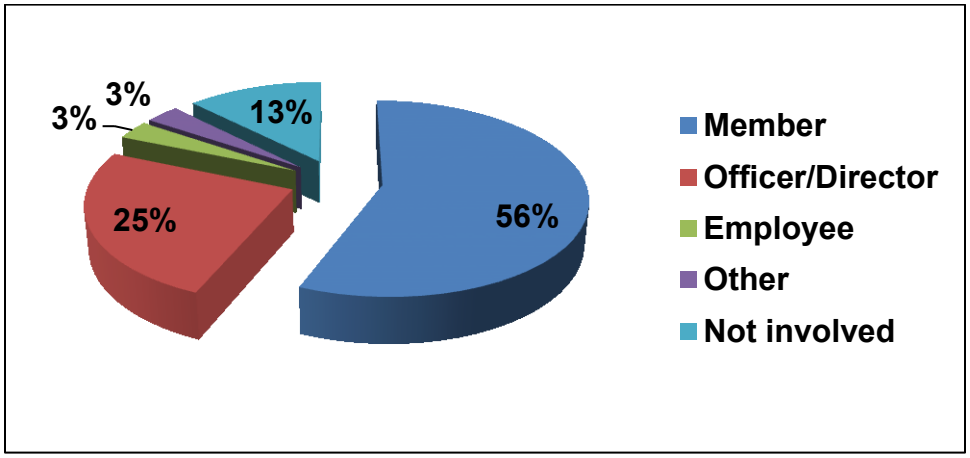
Table 5.1: Sales Outlets

Ranking	Outlet	% Farmers	Avg. Price Received
1	Chestnut Growers Inc.	72%	$1.50
2	Direct on farm sales	41%	$2.50
3	Farmers market	24%	$5.00
4	Upscale grocery stores	14%	$3.00
4	Wholesalers	14%	$2.50
4	Restaurants	14%	$3.50
7	Other (usually u-pick)	10%	N/A
8	Distributor	4%	$3.00
9	Online, direct to customers	4%	$5.50

Note also that although many farmers sell to different outlets, they sell the largest percentage of their harvest either to CGI on directly on the farm. Only a few respondents sell exclusively to higher end outlets such as upscale grocery stores or restaurants. Although co-op members are required by the CGI bylaws to sell a percentage of their harvest to CGI, many do not sell any nuts to CGI at all.

What factors affect these varying levels of participation? Of the 32 respondents involved in the survey, 82% (26 people) are members of the cooperative. Figure 5.3 provides a graphical breakdown of group membership. Note that of the 26 people in the co-op, eight are directly involved in the leadership of the cooperative.

Figure 5.3: Respondents' Participation Levels in CGI



In response to whether group members would seek out another co-op if CGI shut down, respondents were unlikely to find a new co-op. On a 7 point Likert scale, the average response was 5.26 (1 being very likely to seek another co-op and 7 being very unlikely to seek another co-op); 37% are extremely unlikely (score of 7) to seek another co-op, 9% are indifferent (score of 4), and 11% are very likely (score of 1) to seek another co-op (note that all of these individuals are directly involved in the management of CGI). Leaders of the co-op are more likely than others to seek out another cooperative. Perhaps because most growers have yet to realize positive economic profits from their participation in CGI, they are reluctant to seek other similar organizations.

Table 5.2 below begins to touch on respondents' specific perceptions about Chestnut Growers Inc. In general, group members feel a sense of belonging to CGI. The cooperative fosters a strong sense of community wherein group members feel a part of the CGI family and directly involved in the fair and equitable decision-making process of the co-op. This strong communal environment is manifested in group members investing time and effort into CGI above and beyond group norms. Just as

importantly, group members develop a psychological attachment as well (i.e. “In general, I have invested a great deal of myself into CGI”). This is a clear example of *attachment value*.

Table 5.2: Group Member Perceptions of CGI

	Strongly Agree						**Strongly Disagree**	**Variance**
	1	**2**	**3**	**4**	**5**	**6**	**7**	
I receive a fair price for my chestnuts				4.5				2.1
I do not feel a sense of belonging to CGI					5.1			4.2
The voting rights and procedures are fair and equitable			2.6					2.7
I feel included in the decision-making processes of CGI				3.1				3.2
I do not feel like a part of the family at CGI						5.7		3.1
I feel I have too few options to consider leaving CGI					4.8			4.3
In general, I have invested a great deal of myself into CGI				3.3				3.0
I have not given much of my time or effort to CGI and its success or failure					4.7			5.0
Management makes me feel that my opinions are valued				3.0				3.1
I do not feel emotionally attached to CGI					4.4			4.4
In general, I believe that what happens to me is my own doing			2.2					2.1
CGI has a great deal of personal meaning for me				3.6				3.2
It would be very difficult for me to leave CGI now even if I wanted to					4.1			5.0
If I had a choice, I would never have invested in a chestnut orchard						5.5		3.4

It is important to note that group members take on a large amount of personal responsibility (they strongly agree that they control their own destiny). This determined attitude is also apparent in the respondents’ strong disagreement with the statement, “If I had a choice, I would never have invested in a chestnut orchard”. This implies that

group members are both emotionally and financially invested in seeing their chestnut orchard succeed and are willing to do whatever it takes to see it through.

The price received for their chestnuts is the single most important factor in determining a member's participation level (i.e. how much of their crop they sell to CGI). Table 8 shows that members believe that the "Price of products or services" is very important to group members with a score of 1.5 on a 7 point Likert scale. Table 5.3 shows that members slightly disagree that they receive a fair price from CGI for their chestnuts. During co-op meetings this is the main point of contention between group members (personal observation). CGI provides the lowest average price[11] for the farmer's chestnuts. This is due to many factors, but one of the most important and often cited is the lack of a consistent supply of chestnuts from group members. Because the cooperative cannot rely on a consistent supply of chestnuts, they are hindered from entering into long-term contracts with large retailers. These types of relationships would likely enable the co-op to provide higher chestnut returns to members. Although cooperatives traditionally provide services for its members as both a business and "family", group members place the price received for their chestnuts as the single most important factor in determining member participation level and in turn the strength of the organization.

Tables 5.3 and 5.4 display the congruence between CGI values and group member values. Figure 11 highlights the differences between what group members perceive that CGI *currently* values and what group members believe that CGI *should* value.

[11] See Appendix Exhibit A.2 for a further explanation.

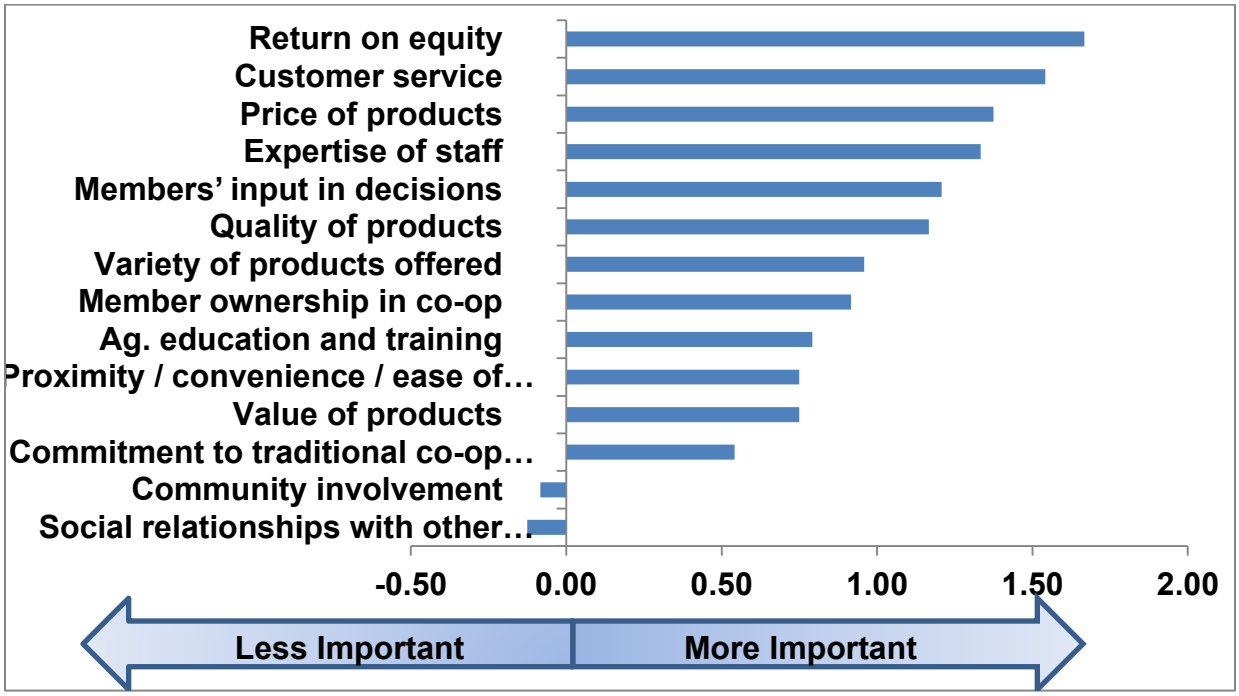
Table 5.3: Group Member Perceptions of CGI's *Current* Values

	Very Important 1 2 3 4 5 6 7 Not Important	Variance
Price of products or services	2.8	3.0
Members' input in decision-making process	3.5	3.1
Variety of products / services offered	3.2	3.0
Customer service	3.0	2.5
Professionalism / expertise of staff	2.8	2.5
Quality of products / services	2.4	1.7
Agricultural education and training	3.6	4.6
Member ownership and control in the co-op	3.0	3.1
Proximity / convenience / ease of use	3.6	3.0
Social relationships with other members	3.8	3.8
Return on equity	3.3	5.2
Community involvement	4.2	3.5
Value of products or services	2.5	2.7
Commitment to the traditional cooperative ideals	3.3	3.1

Table 5.4: Group Member Values (What the Co-op *Should* Value)

	Very Important						Not Important	Variance
	1	2	3	4	5	6	7	
Price of products or services	1.5							0.3
Members' input in decision-making process		2.3						1.3
Variety of products / services offered		2.5						2.6
Customer service	1.5							0.4
Professionalism / expertise of staff	1.6							0.6
Quality of products / services	1.2							0.3
Agricultural education and training			2.8					3.3
Member ownership and control in the co-op		1.9						0.9
Proximity / convenience / ease of use			2.6					1.0
Social relationships with other members				3.9				2.7
Return on equity		1.6						1.6
Community involvement				4.3				2.1
Value of products or services		1.9						1.0
Commitment to the traditional cooperative ideals			2.8					2.0

Figure 5.4: Dissonance Between Perceived CGI Values and Group Member Values



Note: Positive values suggest that respondents believe the cooperative should place *more* emphasis on that characteristic.

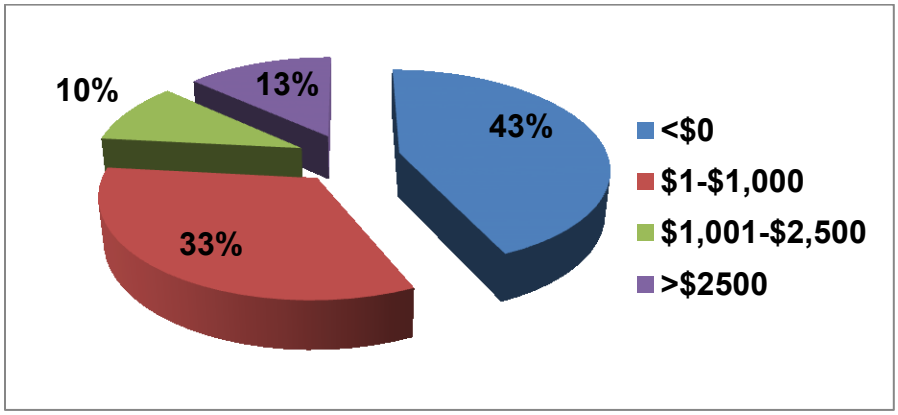
Figure 5.4 clearly shows that in general, co-op members believe that the organization is not placing enough importance on business related issues. For example, return on equity (i.e. money received by members from investments in the co-op) and the price of products have the largest positive difference between what group members perceive that CGI values and what group members believe CGI should value. The only two issues that group members believe that CGI should place less emphasis on are community involvement and social relationships among the co-op members. These two categories fall under the "family" aspect of a traditional cooperative as the group members do not believe that these two items should be as important to the co-op as they currently are. This theme is reinforced by respondents' beliefs that the co-op should be more business oriented than in its current state. In response to the question

regarding co-ops as both a part family and part business organization, 8% want the co-op to have a more family focus, 50% want a more business focus, and 42% are indifferent. Group members believe that cooperatives in general and CGI specifically should be more business focused.

Although group members identify with the organization (as shown in Table 5.2), for the organization to truly succeed they need a consistent supply of chestnuts from co-op members. It is widely shared among the members that CGI cannot succeed without a consistent high quality supply of chestnuts, but farmers do not have the economic incentives to provide this supply because of the low price offered by CGI. Combining this factor with the inherent risks in growing chestnuts (e.g. frost damage, pests, etc.), the future prosperity of CGI is not certain. One solution that may increase participation rates and in turn improve group performance might be to implement strategies that reinforce members' identity with the cooperative and to increase attachment values associated with the success of the group.

According to one farmer at the 2010 CGI annual meeting, "A farmer is a businessman, and that's the bottom line." If farmers are businessmen, then why would they plant chestnuts if they do not currently turn a profit? Less than half (43%) of the respondents reported a negative net income for chestnut production. Of the 57% of farmers generating a positive profit, 59% reported minimal net incomes of less than $1,000 from their chestnut orchard. It should be note that there is long lag period between planting and first harvest: it takes roughly 7.5 years until trees begin reaching maturity and the orchard can start to be profitable. Figure 5.5 details the net income breakdown for the respondents' chestnut orchards.

Figure 5.5: Net Income from Chestnut Production



Survey Conclusion

The depth of the survey questions allows us to analyze quantitatively the differences between farmers. This data paints a broad picture of the typical Michigan chestnut farmer. From this dataset, we can divide our sample into qualitatively distinct subgroups; chestnut enthusiasts/retirement farmers and commercial diversification farmers. Three quantitative variables help differentiate between the two subgroups; percentage of total farm dedicated to chestnut production, sales generated by chestnut orchard, and percentage of total farming time dedicated to chestnut production.

Chestnut enthusiasts/retirement farmers – These farmers devote a large proportion of their time and farm acreage to chestnut production. However, most of these farmers do not derive a large proportion of their farm income from their chestnut orchard. Half of the respondents reported between 0%-5% of farm income from chestnut production. These farmers also tend to have young orchards. The other half of the retirement farmers derive all of their farm income from chestnuts, but they all have less than $5,000 in gross sales.

Commercial diversification farmers – These farmers have larger plots of land, with a much smaller proportion of farm land dedicated to chestnuts. Three of these farmers reported greater than $5,000 in sales, while the other farmers have yet to have their chestnut orchard reach full capacity. Chestnuts compose roughly 10% of total farm income. For these farmers, chestnuts are used as a diversification tool (i.e. lower risk and exposure to price fluctuations of their other crops).

> *"The first group farms simply because they have land and are experimental, willing to do anything regardless of cost because farming is a passion and not a primary source of income. The second group thinks more economically, as they want to know the full financial costs upfront"*
>
> - Chestnut enthusiast/retirement farmer

It is important to understand the different subgroups within CGI, as we will use these same terms (chestnut enthusiasts/retirement farmers vs. commercial diversification farmers) to determine what other factors differentiate the members and affect their participation rate.

Interview Results

At the end of our first data collection method, the survey, respondents were asked whether they were willing to participate further in the study through either interviews or group discussions. Half of the respondents (16/32) indicated further interest. We discussed this list with a CGI expert who has been working with the chestnut farmers for over fifteen years. From this review nine interviewees were selected based on geographic, demographic, and group status (core members and non-core members) diversity. First, a letter was sent to each of the nine selected farmers and email follow-ups were conducted to coordinate individual interviews at each farmer's home. The goal of the interviews was to determine if an individual's level of

social capital (i.e. how they identified with CGI) influenced their participation rate (i.e. how much of their crop they gave to the group) in the cooperative. Using the retirement/commercial dichotomy developed above in the initial survey, we can explore if social capital is the underlying motivational factor. The results of these interviews follow below.

Interview Section I: Demographics

The purpose of the individual interviews was to understand the underlying motivations of each member and what incentives influenced their decisions. The first section of the interviews verified background information from the survey and set to establish each interviewee along the retirement/commercial farmer dichotomy. This differentiation was based on the quantitative variables discussed in the initial survey (e.g. farm size, amount of time spent on chestnuts, chestnut sales) and more importantly a new proxy variable for social capital – percentage of harvest sold to the cooperative. The theory is that individuals who internalize the well-being of the group (cooperative) have higher levels of social capital and therefore participate more in the co-op. The proxy variable for this participation rate is therefore the percentage of harvest sold to the co-op.

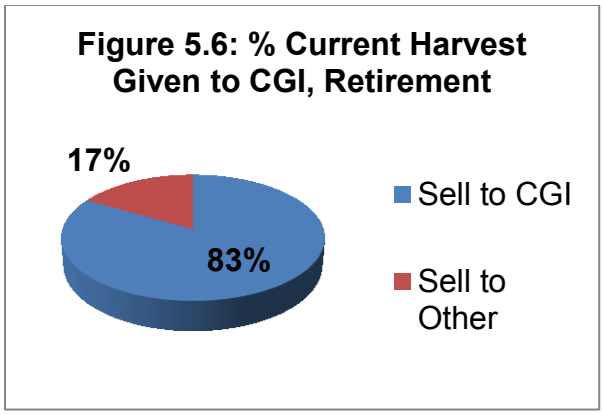
Question: How large is your farm? What percentage is dedicated to chestnuts? How much of your farming time do you dedicate to chestnuts?

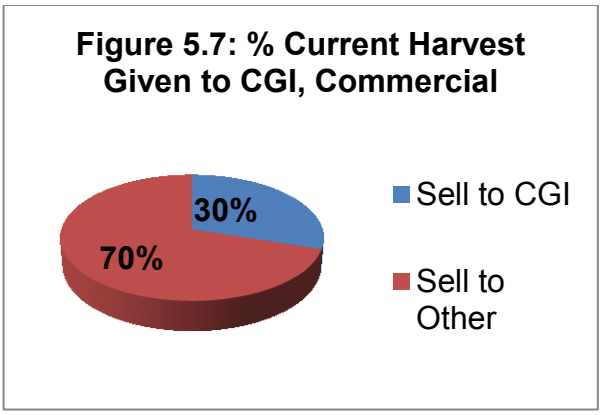
There is no direct correlation between the size of the respondent's farm and the percentage of farm area dedicated to chestnuts. Whether a retirement or commercial farmer, the size of each individual farm varies from over 100 acres to just 17.5 acres. However, there is an explicit difference in the amount of time spent working on their

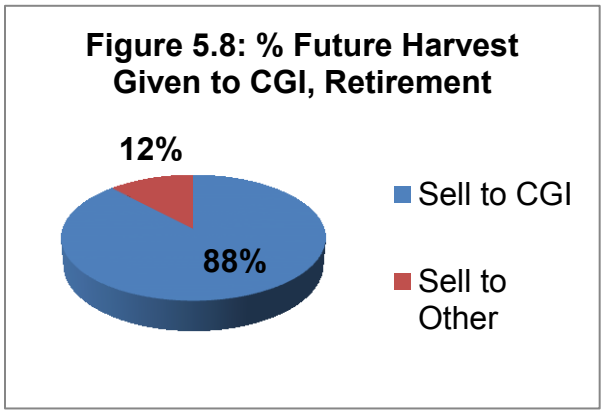
chestnut orchard. Retirement famers spend over half of their farming time on their chestnut orchard. This “farming time” is also significantly more than commercial farmers as commercial farmers devote more of their time to other business ventures such as other crops or their primary source of income (e.g. one of the commercial farmers is a full-time barber).

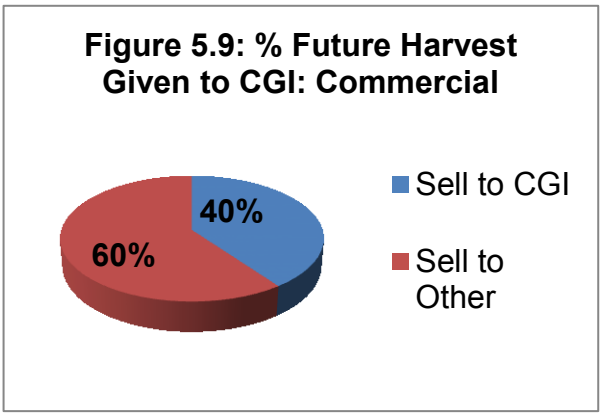
The 2010 growing season was a bad year for chestnut farmers in Michigan. Frost wiped out many farmers’ crops. As such, all of the farmers interviewed had lower crop yields than expected, and all expected crop yields to at least double in the next harvesting season[12]. All respondents take this same positive outlook for the future in terms of their participation level with the co-op. The figures below outline the stark discrepancy between the retirement and commercial farmers, as retirement farmers currently give 83% of their crop to CGI (Figure 5.6) while commercial farmers deliver only 30% of their crop (Figure 5.7). Both groups have positive expectations for the co-op and expect to increase their participation levels in the next (i.e. 2011) harvest season (Figures 5.8-5.9).

[12] During the next harvesting season, chestnut farmers realized record yields in 2011.









Interview Section II: Measuring Group Attachment Value

These set of questions set out to establish a baseline of each respondent's level of social capital with the co-op. After analyzing these responses, we will explore the hypothesis that respondents with high social capital (as measured by positive responses to the questions below) are likely to be the most active participants in the cooperative (as measured above in percentage of harvest given to the co-op).

Question: Do you associate with co-op members outside of business transactions?

All of the respondents answered yes. However, their answers varied greatly from sharing information and offering to work on each other's orchards (retirement farmers), to "Yes, but minimal. Distance is a big factor." (commercial farmer). This distance factor

affects all of the respondents universally. Since the group is so geographically dispersed, in most cases it is unfeasible to associate with the other CGI members outside of CGI business. The respondents are therefore not likely members of the same social groups (e.g. church, rotary club, etc.).

Despite not being members of the same social group, a few co-op members perform business with cooperative members outside of CGI business. This involves sharing resources such as pruning equipment or reselling poor quality chestnuts to friends. These transactions help strengthen ties between co-op members, and it is telling that two-thirds of the individuals who engage in this behavior are retirement farmers.

Question: Do you share the same political philosophy/worldview as most other co-op members?

Co-op members are a diverse group, and as such a diverse array of responses was garnered to the above question. For example one farmer stated, “No, I don’t have the same point of view as the others as they are mostly retired government workers.” While respondents might have differing political or worldviews, there emerged a pattern regarding the individual’s knowledge of other co-op member’s worldviews. The typical retirement farmer viewpoint is reflected in the response, “No, we all have different political and business points of view. The cooperative is a family and everyone brings different viewpoints.” This contrasts with a commercial farmer’s response of, “I have never talked to them so I do not know.” There was no correlation between type of worldview and type of farmer (i.e. retirement farmers are not universally liberal or conservative). This lack of a coherent worldview speaks to the dissonance within the

group and the lack of cohesion in group goals as some are short term and the others take a long-term point of view. This dynamic will be further explored in the last section of interview questions where respondents are asked about their perceptions of the purpose of the cooperative.

While respondents might have differing political or worldviews, there emerged a pattern regarding the individual's knowledge of other co-op member's worldviews. The typical retirement farmer viewpoint is reflected in the response, "No, we all have different political and business points of view. The cooperative is a family and everyone brings different viewpoints." This contrasts with a commercial farmer's response of "I have never talked to them so I do not know."

Table 5.5 outlines each respondent's reaction to the second set of questions. Each of the nine respondents are divided into their respective category of retirement farmer and commercial. The letter "Y" implies a positive answer to the question, the letter "N" implies a negative answer to the question, and when a neutral response was given a "-" is used. For example, the first respondent is categorized as a retirement farmer (they give most of their crop to the co-op and derive most of their farm income from chestnuts). Farmer 1's responses to social capital incentives questions:

1. This farmer spends time with CGI members outside of co-op business.

1a. This farmer would be members of the same social group as other CGI members, if they were close (distance) enough.

2. This farmer does not perform business with co-op members outside of chestnuts.
3. This farmer is not related to any other CGI members.

4. This famer shares the same political philosophy as some of the other members, but disagrees with some of the other farmers' short-term focused viewpoint.

It is noted that retirement farmers are more actively involved in social activities with other cooperative members. They also are more likely to engage in business with other CGI members outside of chestnuts. There is no distinct differentiation in a farmer's worldview/political philosophy, but this question will become more distinct along the commercial/retirement divide when we discuss the respondents' views on CGI as an organization.

Table 5.5: Measuring Group Attachment Value Questions & Responses

	Q1. Spend time with members outside CGI?	Q1a. Same social group?	Q2. Business with members outside chestnuts?	Q3. Related to members?	Q4. Same political philosophy?
RETIREMENT	Y	-	N	N	-
COMMERCIAL	N	N	N	N	Y
COMMERCIAL	Y	N	Y	N	N
COMMERCIAL	Y	N	N	N	Y
RETIREMENT	Y	-	Y	N	Y
COMMERCIAL	N	N	N	N	-
RETIREMENT	Y	N	Y	N	N
COMMERCIAL	Y	N	N	N	N
RETIREMENT	Y	N	N	N	N

Interview Section III: Hypothetical Scenario Analysis

This set of questions presented the interviewees with a series of hypothetical scenarios meant to garner their reactions quickly so that the respondent could only give an intuitive answer. The questions were created as reciprocal scenarios: If you became sick for a long period of time (more than a month), would you expect other co-op members to sincerely offer to help run your farm or in other ways assist you help maintain your business? If another co-op member became sick for a long period of time, would you take care of their farm or in other ways offer substantial help if asked? *Question: If you had a wedding, would you invite other cooperative members? If yes, how many? How many do you think would attend?*

All of the retirement farmers answered in the affirmative, with one retirement farmer stating, “Yes I would invite other members. I only know half, but all would attend. I have good relationships with co-op members.” Despite most farmers stating that they would invite co-op members, there was a noticeable lack of reciprocity. Although most farmers would invite co-op members to their wedding, half of that sample did not believe that they would be invited to another co-op member’s wedding. This lack of reciprocity is exhibited in every hypothetical question. The respondent is more likely to offer help, time, or money than to expect the same kindness from other cooperative members. For example, twice as many people would offer help to a sick co-op member than would expect help if they were sick themselves.

These hypothetical questions helped further differentiate the subjects along the retirement/commercial dichotomy. The retirement farmers were significantly more likely to offer help to other cooperative members and were also more likely to expect help

from other co-op members as they have established relationships with all of these individuals. Commercial farmers were less likely to offer help and almost never expected help in return. Their point of view can best be summarized by one commercial farmer who stated, “We share only one common interest with members, chestnuts.”

The results of this section (shown in Table 5.6) further highlight the differences between the two subgroups, as this led retirement farmers to state that “We are in this together. We can’t throw friends under the bus for a couple bucks.” This mindset directly contrasts with the commercial point of view that “I liken co-op members to a trade association, not a family.” This attitude influences each respondent’s answers to all of their subsequent questions.

Table 5.6: Scenario Analysis Questions & Responses

	Q1. Invite co-op to wedding?	Q2. Co-op invite you to wedding?	Q3. If sick, expect help from co-op?	Q4. Help another sick member?	Q5. If car broke, ask co-op for ride?	Q6. Offer ride to member?	Q7. Would you offer a loan?	Q8. Expect loan offer?
RETIREMENT	Y	N	N	Y	N	Y	N	N
COMMERCIAL	Y	-	Y	N	Y	Y	N	N
COMMERCIAL	N	N	N	-	Y	Y	N	N
COMMERCIAL	Y	Y	Y	Y	Y	Y	Y	N
RETIREMENT	Y	Y	Y	Y	Y	Y	-	N
COMMERCIAL	N	N	N	Y	Y	Y	N	N
RETIREMENT	Y	Y	Y	Y	Y	Y	Y	N
COMMERCIAL	N	N	N	-	Y	Y	N	N
RETIREMENT	Y	-	N	Y	Y	Y	Y	Y

Interview Sections IV-V: Prices & Economic Incentives

The next set of questions set out to understand the impact of different incentives on the behavior of co-op members. These incentives vary from pricing schemes to different group services provided by the cooperative. The hypothesis is that commercial farmers will adjust their behavior depending on economic incentives while retirement farmers' behavior will not change regardless of economic incentives offered. Hypothetically, commercial farmers are driven by the ultimate profitability of their decisions while retirement farmers internalize the well-being of the cooperative and therefore are not motivated by economic considerations.

Question: If the cooperative offered the same price as other outlets (i.e. on farm, farmers market) for your fresh chestnuts, how much of your crop would you sell to the cooperative (percentage)?

As a small, niche and fragmented market, there is no established industry standard for setting chestnut prices. Almost every cooperative member receives a higher price for their chestnuts through other retail outlets (e.g. farmers markets or at-the-gate sales). This is the most pertinent current issue for co-op members. Therefore, every single member stated that they would give more chestnuts to the cooperative if the co-op offered the same price as other outlets.

Question: Let's say that your local farmers market is offering $3/lb. for your fresh chestnuts, what is the minimum price that the co-op would have to offer you so that you give them the same amount of chestnuts you currently do?

Commercial farmers have a higher average threshold of $2.06 to maintain their current participation levels, while 75% of retirement farmers would still give their entire

crop to the cooperative regardless of price. All of the farmers support the idea of a tiered compensation scheme, determined either by nut size and quality or by percentage of an individual's harvest sold to the cooperative. All except two interviewees are in favor of receiving a guaranteed payment upfront, which speaks to the risk-averse nature of the group. Table 5.7 outlines these responses.

Overall, all of the proposed incentives would not significantly change any retirement farmer's behavior as one stated, "Loyalty is already intact. I do not need extra incentives to change my behavior." So regardless of the incentives offered, the retirement farmers will still give most of their crop to the cooperative. In regards to commercial farmers, different incentives induce different behaviors (see Table 5.8). One respondent cited the specific $500 round-trip price to drop chestnuts off at the processing facility in Clarksville. Commercial farmers quantified the direct economic impact of a proposed incentive (e.g. an additional $50 for processing costs), versus retirement farmers who did not even consider the economic impact of the proposed incentives.

Table 5.7: Pricing Questions & Responses

	Q1.	Q2.	Q3.	Q4.	Q5.	Q6.
	Co-op offer same price as other outlets?	Minimum price from co-op to maintain current level?	Co-op offers fixed price?	Compensation based on quality?	Compensation based on % of harvest?	Fixed payment upfront or wait?
RETIREMENT	**-**	-	-	-	-	Upfront
COMMERCIAL	↑	$2.25	-	Y	Y	Upfront
COMMERCIAL	↑	$1.50	-	Y	Y	Upfront
COMMERCIAL	↑	$2.50	↑	Y	Y	Wait
RETIREMENT	↑	-	-	Y	Y	Upfront
COMMERCIAL	↑	$2.00	-	Y	Y	Wait
RETIREMENT	↑	$1.50	↑	Y	Y	Upfront
COMMERCIAL	↑	-	-	Y	Y	Upfront
RETIREMENT	**-**	-	-	Y	Y	Upfront

Table 5.8: Economic Incentives Questions & Responses

	Q1.	Q2.	Q3.	Q4.	Q5.
	Access to CGI harvesting equipment?	Closer to processing facility?	Pick-up service?	Legally obligated to sell part of harvest to CGI?	Members be forced out if give no nuts?
RETIREMENT	-	-	-	Y	Y
COMMERCIAL	↑	-	-	N	N
COMMERCIAL	-	↑	↑	Y	-
COMMERCIAL	-	-	-	Y	Y
RETIREMENT	↑	-	-	Y	Y
COMMERCIAL	-	-	↑	Y	-
RETIREMENT	-	-	↑	Y	Y
COMMERCIAL	↑	↑	↑	Y	N
RETIREMENT	↑	-	-	Y	Y

	Q6.
	How would you allocate between fresh and value-added? Present vs. future?
RETIREMENT	Give all nuts to CGI, as board member want to diversify.
COMMERCIAL	100%, money there. No change over time.
COMMERCIAL	Some manner in practice (not always have the harvest).
COMMERCIAL	60-40. No change, initially 100% value-added. No market for peeled/fresh-frozen.
RETIREMENT	80-20, don't have enough nuts. In 5 yrs 60-40.
COMMERCIAL	25-75, assume fresh is stable and growth in value-added
RETIREMENT	Prefer 25-75 because more money, but market dictates 80-20
COMMERCIAL	25-75, stay constant to reach 80K lbs. Have to continually replace customer base.
RETIREMENT	75-25, move towards 50-50

Interview Sections VI-VII: Knowledge Sources & Access to Markets

This section sets out to determine how much of the cooperative members trust different information sources. One important asset of CGI is their partnership with Michigan State University. MSU works with CGI to help develop new products, research proper cultivars, and establish best-practices for chestnut farmers. This information is transmitted to the growers from two different sources, directly from professors or extension agents, or through CGI at their regular meetings. All of the interviewees greatly respect any advice offered by the individual that experiments with techniques in the chestnut orchard at the Roger's Reserve. Their responses ranged from, "Yes, absolutely, worth weight in gold" to "Yes, access to people like that are invaluable". When asked about the professor that works directly with the co-op, there was no unanimous response, as respondents varied their answers along the retirement/commercial dichotomy. For example, retirement farmers typically stated, "Yes, a great deal, save all information, otherwise I make more mistakes. Dr. X is intelligent and passionate." Commercial farmers either do not follow his recommendations or do so begrudgingly, "Yes, unfortunately we follow his advice."
Question: On a scale of 1 to 10, how much do you trust the leadership of CGI to act in the best interest of CGI?

The average score for retirement farmers was 8.25. The average score for commercial farmers was 5.40. Retirement farmers obviously trust the leadership of CGI more than commercial farmers. This question speaks to two different dynamics: commercial farmers are more concerned with short-term financial returns and most of the board members are composed of retirement farmers. Commercial farmers view their

chestnut farms as an important source of income, and therefore rely on the current financial returns of their chestnut orchard to live. On the other hand, retirement farmers view their chestnut orchard as something to fill their time after retirement. Therefore because the cooperative is still not profitable, commercial farmers do not believe as strongly in the leadership of CGI. Of the nine interviewees, four were on the CGI board of directors and three of those four are classified as “retirement” farmers. Because commercial farmers feel that they do not have a voice in the direction of the organization, they are much less likely to trust in the leadership of CGI and this may be on reason that they participate at lower levels (i.e. give less percentage of crop to CGI). Less involved individuals in the cooperative also have lower association levels with the co-op, which reinforces their low participation levels. See Table 5.9 for an outline of their responses.

In regards to questions about access to different markets, there would no effect on respondent’s behaviors. None of the proposed scenarios would change interviewees’ behavior, as one person summarized, “No change. This is not a current issue as we do not yet have the supply for this to be an issue.”

Table 5.9: Knowledge Sources Questions & Responses

	Q1. Implement techniques recommended by Dr. Fulbright?	Q2. Value advice from Mario?	Q3. Trust leadership? Scale 1-10.
RETIREMENT	Y	Y	8
COMMERCIAL	-	Y	3
COMMERCIAL	N	Y	5
COMMERCIAL	Y	Y	7
RETIREMENT	Y	Y	7
COMMERCIAL	N	Y	9
RETIREMENT	Y	Y	10
COMMERCIAL	Y	Y	3
RETIREMENT	Y	Y	8

Interview Section VIII: Organizational Legitimacy

This set of questions set out to explore whether perceived organizational legitimacy[13] affected cooperative member participation rates. One way to measure the legitimacy of the organization is to determine if the membership has consistent views of the organization and its activities, such as its brand. According to the CGI members interviewed for this study, there are decidedly mixed results as to whether CGI is an established brand name or not. Table 5.10 outlines their responses. Five of the nine interviewees expressed that CGI is in fact an established brand name, while the other four did not agree. These responses were divided equally among the retirement and commercial famers. However, the follow-up question clearly highlighted the retirement/commercial dichotomy. All of the retirement famers felt that it is easier to market their crop through the cooperative, “This is the purpose of the co-op.” Three of the five commercial farmers believed that is easier to market the chestnuts themselves, “Far easier to market individually, more work dealing with co-op.” Thus, while CGI may not be an established brand, retirement farmers believe that it is easier to market their crop through CGI, another reason why they may participate at higher levels (i.e. give more of their crop to CGI) than commercial farmers.

Q3a. Do you receive higher returns as a member of the co-op or not?

Q3b. If no, then why are you a member of the co-op?

[13] Organizational legitimacy, which falls under the organizational identity school of thought, is best defined by Suchman (1995), “Legitimacy is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions.” For our purposes, we set out to ascertain whether perceived organizational legitimacy affected interviewee behavior. Note that the legitimacy of an organization is negatively affected by inconsistencies in the conveyance of said organizational identity (Meyer & Scott, 1983).

Only one of the nine interviewees receives a higher financial return through the co-op than other market outlets. Despite a lower financial return, all the interview subjects identify themselves as members of the cooperative. Why? Each individual gave different reasons, but the underlying theme was the potential for increased financial return in the future. These responses included, “Look towards the future”, “Trivial, not paying attention to current financial return”, and “Will be more profitable in the future.” There is a universal belief in the co-op, and the farmers realize that they must develop the organization to realize a healthy future economic return on their chestnut orchards. It is important to note that both retirement and commercial farmers stated the same fundamental reason for belonging to CGI, *the potential for greater financial return in the future*.

Table 5.10: Organizational Legitimacy Questions and Responses

	Q1.	Q2.	Q3.a	Q3.b
	Is CGI an established brand name?	Easier to market through co-op than individually?	Receive higher financial return as member of co-op?	If no higher profit, then why are you a member of CGI?
RETIREMENT	Y	Y	N	Will be more profitable in the future
COMMERCIAL	Y	N	N	Continuing tradition of deceased father
COMMERCIAL	N	N	N	Because I am forward looking
COMMERCIAL	N	Y	N	Look towards the future
RETIREMENT	Y	Y	N	Believe in potential, but need proper cultivar and storage techniques
COMMERCIAL	Y	Y	N	Trivial, not paying attention to current financial return
RETIREMENT	N	Y	-	-
COMMERCIAL	N	N	N	More to it than money, access to people
RETIREMENT	Y	Y	Y	No processing costs as a member

Interview Section IX. Conclusion

The final set of questions set out to determine how the cooperative's perceived goals align with what each individual farmer believes these goals should be. Each interviewee expressed a slighltly different opinion on the goal of the co-op (see Table 5.11). However, the underlying theme of each response is that the goal of the cooperative is financial, "The goal of the cooperative is to sell chestnuts and make money for the members." This aligns with eight of the nine farmer's belief of what the goal of the co-op should be. For example, one commercial farmer stated, "Farmers don't want to be told what to do. Grow what they want, when they want." Another commercial farmer voiced the dissonance between the percieved goals of the co-op and what they believe the co-op goals should be, "No shared interest in growing chestnuts as communal production." This farmer does not perceive the group acting as one body, rather a loosely connected group of individuals with individual profit-maximizing motivations.

The interview subjects were divided into two sub-groups, retirement and commercial. The retirement farmers particpate more in the co-op by giving a larger percentage of their harvest to CGI. They are also more actively involved in the management of the organization. As such, they identify more with the group and are in agreement that the goals of the cooperative match their own.

Table 5.11: Conclusions Questions & Responses

	Q1.	Q2.	Q3.
	What do you believe is the purpose/goal/mission of CGI?	Do you agree with this purpose/goal/ mission?	What do you think the goal of the co-op should be?
RETIREMENT	Sell chestnuts, make money for members.	Y	Make money for growers. Social group is MMPC, while CGI is a business.
COMMERCIAL	Service large volume of chestnuts, and use excess for value-added	Y	-
COMMERCIAL	To be forward looking, prepare for the future, address issues as they arise.	N	-
COMMERCIAL	Extension of my farm.	Y	-
RETIREMENT	If people cooperate, help chestnut industry grow and make chestnuts a viable commodity.	Y	Make chestnuts a viable commodity.
COMMERCIAL	Make money for growers. Figure out what people want and give it to them.	Y	Outlet for good growers to take chestnuts and max profitability.
RETIREMENT	To grow and sell chestnuts PROFITABLY.	Y	To grow and sell chestnuts PROFITABLY.
COMMERCIAL	To establish a market for chestnuts	Y	To enhance the marketability of chestnuts, elevate perceived retail price.
RETIREMENT	Develop and grow community and chestnut industry in MI with a sustainable chestnut crop.	Y	Need to do better to commit to price, come with time.

Section VI: Conclusion

This thesis set out to address a specific question – why do cooperative members sell different amounts of chestnuts to the co-op? From this simple question we were able to explore how organizational structure and identity affected members' behavior. We determined that since these individuals associated attachment value with the organization (i.e. developed social capital), they internalized the welfare of the cooperative and were willing to overlook the fact that they received a lower price for their crop than could be achieved through other markets. We hypothesize that other groups with similar organizational features (i.e. small, young entrepreneurial ventures) exhibit the same pattern of behavior, and that successful organizations rely on social capital to mature into established profitable firms.

An additional hypothesis can also help explain this phenomenon – risk adverse individuals will join the cooperative because the co-op provides a guaranteed market for their chestnuts. Chestnuts are still a relatively unknown product to consumers. Therefore if a farmer has a good year and cannot sell all of his nuts on-the-farm, he needs another sales outlet to take his product. For reference, see Section IV. where the most common risk factors to profitability for farmers were; how to grow and harvest the best chestnuts, and lack of knowledge of where and how to market their chestnuts. The cooperative was created to explicitly address both of these issues.

Recommendations & Actionable Strategies for CGI

1. *Increase group member's attachment values with the cooperative* – This study has shown that social capital can be a competitive advantage for cooperatives. This intangible asset holds the group together during the entrepreneurial growth stage, as

economic returns are yet to be realized. Members internalize the well-being of the organization and go above and beyond standard member requirements to ensure the success of the group. As a member's association and identification with cooperative's identity increases, so does their participation rate and in turn firm performance. A basic level of sympathy within group members for the organization is in a sense necessary for entrepreneurial ventures to succeed and advance beyond their first growth stage to where the firm can begin creating true economic profit. By this logic, we would propose that cooperatives should actively promote activities that increase co-op members' attachment values with the organization.

2. *Emphasize and quantify the value created by the cooperative* – The survey and interview data has shown that group members have different perceptions of what activities the co-op performs. The cooperative needs to do a better job of explicitly communicating the activities they provide; cleaning, cold storage, sizing, bagging, shipping, advertising, etc. Because members do not internalize all of their own costs (for example they do not associate a financial value for all of the time they spend ending their orchard), they balk at the explicit costs of the activities that the co-op performs. Rather than just comparing the end price received, the farmers should base their decisions on net profit. By emphasizing the value-added activities that the cooperative provides and outlining these benefits explicitly, the co-op can encourage greater participation and in turn achieve economies-of-scale in processing, marketing, and the sale of chestnuts (the base tenants of a marketing cooperative).
3. *Hire a manager with experience running a similar organization* – The current management structure is composed of a president and various senior officers that

make up roughly one-fourth of the total membership. Only one of these individuals self-identified as a commercial farmer. This only reinforces the perception that the leadership lacks business/farming experience. For example in Figure 11, there is a large dissonance between member's expectations and the perceived performance of the co-op. Hiring a manager with experience or time to dedicate to the management functions of the cooperative would help alleviate that gap and improve member's association and participation within CGI[14].

Limitations of Current Research and Future Research Proposals

Through the application of the case study research method, we were able to create a rich story about the unique dynamics of Chestnut Growers Inc. By primary data collection methods, including a survey and interview, we were able to explore the underlying motivations of cooperative members' behaviors. The inherent characteristics of the target population led to research constraints. The sample size was small, which ruled out the use of any type of econometric analysis as the small sample size would lead to bias. Another limitation of the research is that we first had to establish the story of the situation, paint a picture of the typical chestnut farmer. These type of questions ascertained *what* actions the farmers performed, but ideally we would like to explore more types of questions that asked *why* they performed the actions they did.

Future research should analyze different types of organizations, to determine whether the structure of the organization affects a member's attachment value for that organization. For example, do members of a large public company associate the same levels of affinity to their organization as members of a small firm composed of a single

[14] Update: In 2012, the director of CGI retired from his government job and now devotes 100% of his time managing CGI.

family? Does group homogenization affect the level of social capital? Further studies could analyze how social capital was built within a group and how this asset increases or decreases over time. Along the same theme, a longitudinal study of a variety of cooperatives could help determine whether all cooperatives rely on member attachment values to flourish. Perhaps social capital is a necessary condition for entrepreneurial ventures to succeed, as members need a different motivation during the initial time period of inadequate financial returns.

We believe that the research has helped establish new links and enriched the literature on factors affecting cooperative performance and provided a specific case study example of social capital as an intangible asset and a source of competitive advantage for organizations.

Appendices

Exhibit A.1: Midwest Chestnut Growers Survey

Survey Number_____

Survey of Midwest Chestnut Growers

August 22nd, 2010

Thank you for agreeing to participate in this survey of Midwest chestnut growers. The information that you provide in this exercise will be treated confidentially and used exclusively for scientific research and will not be shared with anyone outside of this research project. This survey is a part of a large research project looking at ways to enhance the viability and profitability of the Michigan Chestnut Industry. We encourage you to make your best educated estimates when providing information on your chestnut production. It is expected that this survey will take approximately 45 minutes to complete.

Instructions

Words in **bold** are questions. Words in *italics* are instructions to help you answer the question. When answering a question with a list of possible answers, please circle the letter corresponding with your choice. For example:

Z01. What are Michigan State's colors?

A Black and Blue

B Red and White

(C) Green and White

I. TELL US ABOUT YOUR FARM

This section is to help us learn about the general characteristics of your farm.

A01. Where is your farm located (zip code)?

_____

A02. How large is your entire farm in acres?

_____

A02a. What percentage of your household income is generated from your farm?

A 0-10%

B 11-25%

C 26-40%

D 41-60%

E 61-80%

F 81-100%

A03. How many acres on your farm are dedicated to chestnut production?

_____

A03a. What percentage of your farm activity (time) is dedicated to chestnut production?

A 0-10%

B 11-25%

C 26-40%

D 41-60%

E 61-80%

F 81-100%

A04. What is the *current* tree planting density (trees/acre) in your orchard?

_____

A05. How many years have you grown chestnut trees?

_____

A06. What is the average age of your orchard (trees) in years?

_____

A07. When was the first year that you grew chestnuts for the purpose of selling nuts? _____

A08. What types of chestnut trees (from *seedlings*) do you have on your farm?

Please list your top 5 and their percentage of the total orchard. For example Dunstan or European.

Seedlings	% of Orchard

A09. What types of chestnut trees (from *cultivars*) do you have on your farm?

Please list your top 5 and their percentage of the total orchard. For example Bouche de Betizac or Colossal.

Cultivars	% of Orchard

A10. What initially attracted you to producing chestnuts?

A Potential for profits

B Interest in chestnut related factors

C Other_____

Explain_____
_____

A11. Over the next five years, which of the following statements best describes your <u>expectations</u> for the size of your chestnut operation?

A I expect that it will grow substantially

B I expect that it will grow by a little bit

C I expect that it will be about the same as it is now

D I expect that it will be smaller

E I expect to no longer be growing and selling chestnuts

A12. In your opinion, which factor is most important in deterring more chestnut producers?

A Lack of resources

B Uncertainty of chestnut market

C Lack of knowledge about chestnuts

D Other

Explain_____

_____

II. STARTING A CHESTNUT ORHARD

When first establishing your chestnut farm, which of the following activities did you perform?

B01. How did you start your orchard?

A Purchased seedlings

B Purchased grafted cultivars

C Purchased seedlings and do own grafting

D Produced seedlings and do own grafting

E Bought previously established chestnut orchard

F Other_____

B02. How do you grow or restock your orchard?

A Purchase seedlings

B Purchase grafted cultivars

C Purchase seedlings and do own grafting

D Produce seedlings and do own grafting

E Other_____

B03. If you purchase stock, on average, how much does each seedling or cultivar cost ($)?

Seedling		**Cultivar**	
A	0-5	A	0-5
B	6-10	B	6-10
C	11-15	C	11-15
D	16-20	D	16-20

E	21-25	E	21-25
F	>26	F	>26

B04. Did you prepare the ground (tilled, leveled, rolled, etc.) for the orchard?

A Yes

B No

B05. Did you place fencing around the orchard or around trees?

A Yes

B No

B06. Did you install an irrigation system?

A Yes

B No

B07. Did you paint the tree trunks to prevent sun scald?

A Yes

B No

B08. Did you install stakes?

A Yes

B No

III. ORCHARD MANAGEMENT

For each activity circle either Yes or No. Frequency refers to the number of times this operation is performed in a crop cycle (1 Year).

Question	Activity	Performed	Frequency (est.)	Total Cost (est.)
C01.	Mowing	Yes or No		$
C02.	Pruning	Yes or No		$
C03.	Fertilizer	Yes or No		$
C04.	Pesticide	Yes or No		$
C05.	Trimming	Yes or No		$
C06.	Mulching	Yes or No		$
C07.	Herbicide	Yes or No		$
C08.	Irrigation	Yes or No		$

C09. How many trees died in the last year (i.e. 2009 growing season including this past winter)?

_____

C10. How many trees did you replace/add in the last year (i.e. 2009)?

_____

C11. Have you ever lost a crop or part of a crop due to frost?

A Full crop

B Part of a crop

C Both A & B

D Never

IV. CHESTNUT HARVEST

D01. On average, how long is your harvest season (in days)?_____

D02. At different times of harvest, how many times do you pick a week?

	Beginning	Middle	End
Times Per Week			

D03. At different times of harvest, how many hours do you spend per pick?

	Beginning	Middle	End
Hours Per Pick			

D04. How do you perform your harvest?

	Self	Machine	Outside Labor
% of Total Harvest			

D05. What percentage of your orchard did you harvest last season (2009)?

A 0%

B 1-25%

C 26-50%

D 51-99%

E 100%

D06. For the last three years, what was the average yield on your orchard (in lbs.)?

_____

D07. For this harvesting season, what is your expected yield at orchard maturity (in lbs.)?

_____

D08. How much does the yield of your orchard vary from year to year?

Low Variation						High Variation
1	2	3	4	5	6	7

V. CHESTNUT MARKETING & PACKAGING

E01. Do you self-grade your chestnuts?

A Yes

B No (*SKIP to question E02*)

E01a. If YES to previous question, then how?

A Eyeball

B Machine sorter

C Other (*please specify)* _____

E02. How would you rate the average quality of you chestnuts?

Low Quality High Quality

1 2 3 4 5 6 7

E02a. How much does the quality of your chestnuts vary *within one harvest*?

Low Variation High Variation

1 2 3 4 5 6 7

E02b. How much does the relative quality of your chestnuts vary *year to year*?

Low Variation High Variation

1 2 3 4 5 6 7

E03. Do you store your chestnuts on farm?

A Yes

B No (*SKIP to question E04*)

E03a. If YES to previous question, for how many days are chestnuts in storage before delivery?

_____

E04. Do you wash chestnuts before storage?

A Yes

B No (*SKIP to question E05*)

E04a. If YES to previous question, what do you wash them with?

A Water

B Preserver

E Other (*please specify)* _____

E05. How do you transport your chestnuts?

A Deliver with own truck

B Buyer picks up

C Share transportation with other producer

D Sell all on farm

E Other (*please specify)* _____

E05a. What is your estimated total cost for transportation?

_____

E06. How do you package your chestnuts?

A Crates supplied by you or receiver

B Buyer picks up

C 5-10 lbs. bags

D 25 lbs. bags

E Other (*please specify)* _____

E06a. What is your estimated total cost for packaging?

_____

E07. Do you advertise your chestnut products?

A Yes

B No (*SKIP to question E08*)

E07a. If YES to previous question, then how do you advertise?

Circle all that apply.

A Website

B Newspaper

C Flyer

D Magazine

E Billboard/Roadside signage

F Catalog

G Radio

H TV

I Roasting/demonstration

J Other (*please specify)*_____

E08. What types of chestnut products do you sell?

Circle all that apply.

A Fresh chestnuts in bulk

B Fresh chestnuts, packaged

C Value-added products (*Please answer question E08a.*)

D Seedlings

E Chestnut seeds

F Chestnut related products

G Grafted cultivars

E08a. If YES to C, then what types of value-added products?

Circle all that apply.

A Chestnut flour

B Dried chestnut kernels

C Frozen chestnuts, peeled

D Chestnut soup mix

E Gift packs

F Chestnut slices

G Other_____

E09. Where do you currently sell your chestnuts or chestnut products?

	Outlet	% of Harvest	Avg. price received
E09.a	Direct on farm sales		
E09.b	Chestnut Growers, Inc.		
E09.c	Restaurants		
E09.d	Distributor		
E09.e	Upscale grocery stores		
E09.f	Online, direct to customer		
E09.g	Wholesalers		
E09.h	Farmers market		
E09.i	Other_____		

E10. Who would you prefer to sell your chestnuts products to?

Rank your top 5 from 1-5.

	Outlet	Rank
E10.a	Direct on farm sales	
E10.b	Chestnut Growers, Inc.	
E10.c	Restaurants	
E10.d	Distributor	
E10.e	Upscale grocery stores	
E10.f	Online, direct to customer	
E10.g	Wholesalers	
E10.h	Farmers market	
E10.i	Ethnic Store	
E10.j	Health store	
E10.l	National chain grocery store	
E10.m	Individual reseller	
E10.n	Discount grocery store	
E10.o	Other farm's outlet	
E10.p	Catalog Sales	
E10.q	Nursery	
E10.r	Other_____	

VI. ATTITUDES REGARDING COOPERATIVES

Please indicate the extent to which you agree or disagree with each of the following statements. Give us your responses based on agricultural cooperatives in general. Please circle the best response using the scale below.

F01. In general, I believe that co-ops:

		Strongly Agree						**Strongly Disagree**
F01.a	Are the lifeblood of the rural community	1	2	3	4	5	6	7
F01.b	Have outlived their usefulness	1	2	3	4	5	6	7
F01.c	Need to become more business oriented	1	2	3	4	5	6	7
F01.d	Have forgotten how important their members are	1	2	3	4	5	6	7
F01.e	Will be successful only if they compete on the basis of price	1	2	3	4	5	6	7
F01.f	Are of little value to the large farmer	1	2	3	4	5	6	7
F01.g	Should listen to members more	1	2	3	4	5	6	7
F01.h	Should not tolerate the financial setbacks of some members that place a burden on the rest of the members	1	2	3	4	5	6	7
F01.i	Are struggling to find their niche in agribusiness	1	2	3	4	5	6	7
F01.j	Should focus more on strengthening the social fiber of our community	1	2	3	4	5	6	7
F01.k	Are of little value to the small famer	1	2	3	4	5	6	7

F02. What is your current level of participation in CGI (Chestnut Growers Inc.)?

A. Member

B. Officer/Director

C. Employee

D. Other_____

E. Not involved in CGI (*SKIP to section VII. CHESTNUT ORCHARD FINANCIALS)*

F03. For how many years have you been associated with CGI?

_____

F04. IF CGI ceased its operations, how likely are you to seek out another co-op organization to meet these same needs?

Very Likely Very Unlikely

1 2 3 4 5 6 7

F05. To what extent do you agree or disagree with the following statements, in relation to Chestnut Growers Inc.:

		Strongly Agree						**Strongly Disagree**
F05.a	I receive a fair price for my chestnuts	1	2	3	4	5	6	7
F05.b	I do not feel a sense of belonging to CGI	1	2	3	4	5	6	7
F05.c	The voting rights and procedures are fair and equitable	1	2	3	4	5	6	7
F05.d	I feel included in the decision-making processes of CGI	1	2	3	4	5	6	7
F05.e	I do not feel like a part of the family at CGI	1	2	3	4	5	6	7
F05.f	I feel I have too few options to consider leaving CGI	1	2	3	4	5	6	7
F05.g	In general, I have invested a great deal of myself into CGI	1	2	3	4	5	6	7
F05.h	I have not given much of my time or effort to CGI and its success or failure	1	2	3	4	5	6	7
F05.i	Management makes me feel that my opinions are valued	1	2	3	4	5	6	7
F05.j	I do not feel emotionally attached to CGI	1	2	3	4	5	6	7
F05.k	In general, I believe that what happens to me is my own doing	1	2	3	4	5	6	7
F05.l	CGI has a great deal of personal meaning for me	1	2	3	4	5	6	7
F05.m	It would be very difficult for me to leave CGI now even if I wanted to	1	2	3	4	5	6	7
F05.n	If I had the choice, I never would have invested in a chestnut orchard	1	2	3	4	5	6	7

F06. Please indicate your perception of the importance Chestnut Growers Inc. places on each of the following items:

		Strongly Agree						Strongly Disagree
F06.a	Price of products or services	1	2	3	4	5	6	7
F06.b	Members' input in decision-making process	1	2	3	4	5	6	7
F06.c	Variety of products / services offered	1	2	3	4	5	6	7
F06.d	Customer service	1	2	3	4	5	6	7
F06.e	Professionalism / expertise of staff	1	2	3	4	5	6	7
F06.f	Quality of products / services	1	2	3	4	5	6	7
F06.g	Agricultural education and training	1	2	3	4	5	6	7
F06.h	Member ownership and control in the co-op	1	2	3	4	5	6	7
F06.i	Proximity / convenience / ease of use	1	2	3	4	5	6	7
F06.j	Social relationships with other members	1	2	3	4	5	6	7
F06.k	Return on equity	1	2	3	4	5	6	7
F06.l	Community involvement	1	2	3	4	5	6	7
F06.m	Value of products or services	1	2	3	4	5	6	7
F06.n	Commitment to the traditional cooperative ideals	1	2	3	4	5	6	7

F07. Now please indicate how important you feel these items *should* be to the co-op:

		Strongly Agree						Strongly Disagree
F07.a	Price of products or services	1	2	3	4	5	6	7
F07.b	Members' input in decision-making process	1	2	3	4	5	6	7
F07.c	Variety of products / services offered	1	2	3	4	5	6	7
F07.d	Customer service	1	2	3	4	5	6	7
F07.e	Professionalism / expertise of staff	1	2	3	4	5	6	7
F07.f	Quality of products / services	1	2	3	4	5	6	7
F07.g	Agricultural education and training	1	2	3	4	5	6	7
F07.h	Member ownership and control in the co-op	1	2	3	4	5	6	7
F07.i	Proximity / convenience / ease of use	1	2	3	4	5	6	7
F07.j	Social relationships with other members	1	2	3	4	5	6	7
F07.k	Return on equity	1	2	3	4	5	6	7
F07.l	Community involvement	1	2	3	4	5	6	7
F07.m	Value of products or services	1	2	3	4	5	6	7
F07.n	Commitment to the traditional cooperative ideals	1	2	3	4	5	6	7

F08. Some experts have characterized co-ops as "part business, part family". That is, they contain both the economic elements of a business and the social, or relational, elements of a family. On the following scales please indicate where you feel the focus of the typical co-op is currently and where you feel they should be focused.

		Business						**Family**
F08.a	Where the co-op is now	1	2	3	4	5	6	7
F08.b	Where the co-op should be	1	2	3	4	5	6	7

VII. CHESTNUT ORCHARD FINANCIALS

G01. What percentage of your farm income is generated from chestnut production?

_____

G02. What were your gross sales generated from chestnut production last year?

A No sales

B <$5,000

C $5,001-$10,000

D $10,001-$50,000

E > $50,000

G03. What was your net income generated from chestnut production last year?

A <$0

B $1-$1,000

C $1,001-$2,500

D $2,501 -$5,000

E $5,001 -$20,000

F >$20,000

G04. How long after establishment was it until you received over $100 in revenue on the chestnut orchard?

A Less than 5 yrs.

B 5-10 yrs.

C 11-15 yrs.

D Greater than 15 yrs.

G05. How long after establishment was it until your chestnut orchard became profitable?

A Less than 5 yrs.

B 5-10 yrs.

C 11-15 yrs.

D Greater than 15 yrs.

E Still not profitable (*SKIP to question G06.*)

G05a. Was this longer or shorter than your expectations?

A Longer

B Shorter

C Same

G06. Do you foresee the wholesale price of fresh chestnuts rising in the future?

A Increasing

B Decreasing

G07. What are the most critical factors that are needed to improve the profitably of chestnut production? Please rank the following factors (circle one number for each question).

(1 being least important, 7 being most important).

	Factor	Ranking						
G07.a	Knowledge of how to market	1	2	3	4	5	6	7
G07.b	Knowledge of potential buyers	1	2	3	4	5	6	7
G07.c	Knowledge of market outlets	1	2	3	4	5	6	7
G07.d	Knowledge of suppliers	1	2	3	4	5	6	7
G07.e	Knowledge of distributors	1	2	3	4	5	6	7
G07.f	Information on cultivar selection	1	2	3	4	5	6	7
G07.g	Information on orchard management	1	2	3	4	5	6	7
G07.h	Information on pest control	1	2	3	4	5	6	7
G07.i	Information on irrigation	1	2	3	4	5	6	7
G07.j	Information on weed control	1	2	3	4	5	6	7
G07.k	Information on grafting	1	2	3	4	5	6	7
G07.l	Better tools and equipment	1	2	3	4	5	6	7
G07.m	More financial resources	1	2	3	4	5	6	7
G07.n	Labor availability	1	2	3	4	5	6	7
G07.o	Other_____	1	2	3	4	5	6	7

G08. What is the competitive advantage of successful chestnut producers? Please rank the following factors (circle one number for each question).

(1 being least important, 7 being most important).

	Factor	Ranking						
G08.a	Knowledge of how to market	1	2	3	4	5	6	7
G08.b	Knowledge of potential buyers	1	2	3	4	5	6	7
G08.c	Knowledge of market outlets	1	2	3	4	5	6	7
G08.d	Knowledge of suppliers	1	2	3	4	5	6	7
G08.e	Knowledge of distributors	1	2	3	4	5	6	7
G08.f	Information on cultivar selection	1	2	3	4	5	6	7
G08.g	Information on orchard management	1	2	3	4	5	6	7
G08.h	Information on pest control	1	2	3	4	5	6	7
G08.i	Information on irrigation	1	2	3	4	5	6	7
G08.j	Information on weed control	1	2	3	4	5	6	7
G08.k	Information on grafting	1	2	3	4	5	6	7
G08.l	Better tools and equipment	1	2	3	4	5	6	7
G08.m	More financial resources	1	2	3	4	5	6	7
G08.n	Labor availability	1	2	3	4	5	6	7
G08.o	Other_____	1	2	3	4	5	6	7

Thank You!

Thank you for participating in our survey. The information you provided will help in our research analyzing the Michigan chestnut industry.

Please feel free to contact Dr. Brent Ross with any questions you might have about our research. He can be contacted at: 317B Agriculture Hall, Michigan State University, East Lansing, MI 48824; by phone (517) 355-2266; or by email rross@msu.edu

If you are willing to participate further in this study by being involved in interviews or focus groups please leave your contact information below.

Name_____

Email_____

Phone #_____

Exhibit A.2: Cover Letter for Survey

September 15th, 2010
Nathaniel Victor
108 Cook Hall
Michigan State University,
East Lansing, MI 48824

Dear_____

In collaboration with Dr. Brent Ross at Michigan State University and the Midwest Nut Growers Association, I am conducting a survey of chestnut marketing and production practices in Michigan. I would greatly appreciate your assistance in this investigation. You have been identified as both an active chestnut grower in Michigan and as a member of Chestnut Growers, Inc. and the information that you provide will be of great importance to us in helping to enhance the viability of the Michigan chestnut industry. Upon completion of the study, the results of the survey, including a report of best management practices and chestnut budgets, will be made available for you to use in your own chestnut operations.

Please find the enclosed the chestnut practices survey and consent form. The survey should take approximately 30 minutes to complete. I have also enclosed a self-addressed, stamped return envelope for you to use to return your completed survey. Thank you in advance for your participation.

Sincerely,

Nathaniel Victor

Exhibit A.3: A Survey of Midwest Chestnut Growers: A Qualitative Overview

Survey Results

Our first data collection method was a survey. This was chosen to help provide general background information about the group so that we could determine which topics were ripe for further exploration in subsequent data collection. We received a response rate of 70% as 32 of the 40 cooperative members responded.

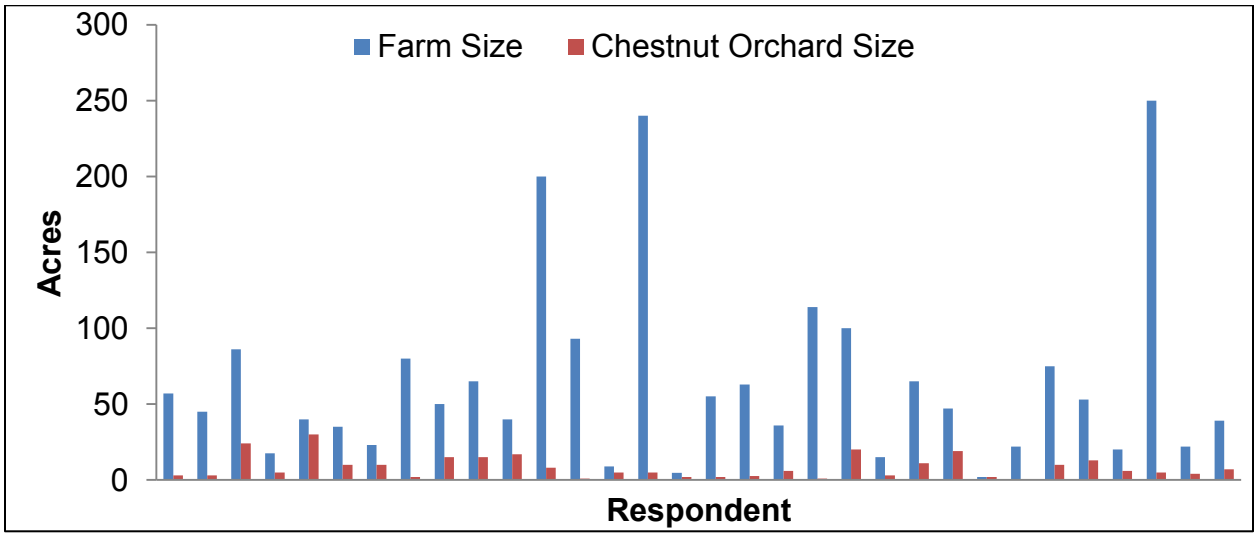
I. Tell Us About Your Farm

The first section details basic facts about each farm's operation such as farm size, years in the chestnut business, and the factors that initially attracted them to chestnuts.

All of the respondents are from Michigan, except one from Iowa who does not ship their chestnuts to CGI. There were 32 respondents (congruent with the small size and niche characteristic of the Michigan chestnut industry).

The average farm size is a total of 64 acres but most farms are within the lower end of this average. The average percentage of farm dedicated to chestnut production is 24% with a mean of 8.60 acres. The following graph compares the size of the entire farm to each farm's chestnut operation, in acres. As you can see, the smaller hobby/retirement operations have a much larger portion of farm dedicated to chestnut production. Larger farms use a smaller percentage of the farm for chestnuts because they mainly see chestnuts as a way to diversify and decrease their exposure to just one crop.

Figure A.1: Farm Size vs. Chestnut Orchard Size



Farming is not the primary source of income for most survey respondents. 88% of farmers stated 0-10% of household income is generated from their farm. Possible explanations for this could be that farmers are harvesting chestnuts as a retirement hobby or that many chestnut orchards are still growing and are not yet fully developed and therefore not turning a profit.

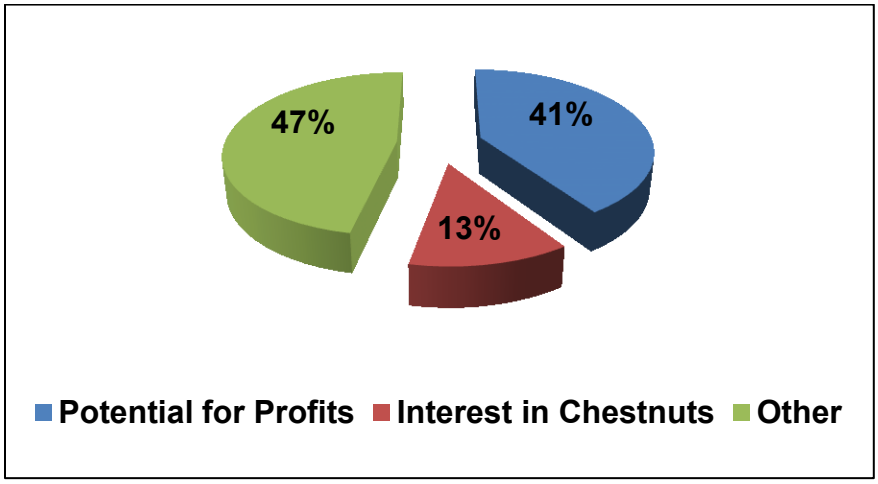
Roughly 50% of the respondents' farm activity time is dedicated to chestnuts. This question helps differentiate survey respondents as attendees at the conference averaged 60% while the mailed-in responses averaged significantly less at 40%. Therefore, mailed-in respondents see chestnuts as more of a hobby/retirement, not a cash crop. There is also a slight correlation between time spent on chestnuts and percentage of farm dedicated to chestnut production.

On average, farmers reported a chestnut tree density of 90 trees per acre. The average age of the respondents' orchard is 11 years. In addition, these farmers have an average of 17 years of experience growing chestnut trees. Also, 1997 is the average starting year for chestnut production. There are two different generations of chestnut farmers, as farmers either started their chestnut orchards 5-8 years or 15 plus years ago.

Chinese is the most popular seedling with many farms reporting 100% Chinese seedlings. However, most famers are transitioning from seedlings to grafted and are grafting their seedlings. Colossal is the most popular cultivar with many reporting over 50% colossal (if used at all).

Survey respondents cited different reasons for establishing a chestnut orchard. Farmers were initially attracted because of potential for profit (40%), alternate source of retirement income, and as a low maintenance or unique/interesting crop. One additional significant reason is that 12.5% of respondents purchased land with pre-established chestnut trees. The following graph summarizes these reasons.

Figure A.2: Initial Attraction to Chestnuts



Respondents are extremely bullish regarding their chestnut operations as 72% anticipate expanding their chestnut orchard within the next five years. 25% will maintain the same size chestnut operation while only one respondent anticipates decreasing the size of their chestnut operation. This optimistic point of view directly relates to Section VII. Chestnut Orchard Financials where 86% of respondents expect chestnut prices to rise within the next five years.

When asked about factors deterring more chestnut producers, a lack of resources was not deemed a pertinent issue. Rather almost all respondents cited a general lack of knowledge about chestnut production or uncertainty of the chestnut market. Many other alternate explanations were cited such as:

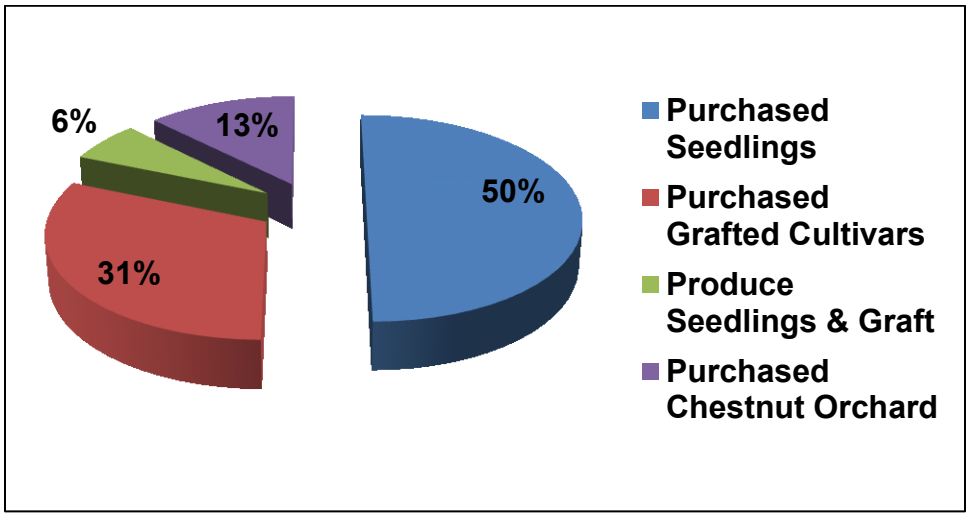
- “Lack of profitability”
- “Lack of economic analysis”
- Age of farmers or hobby/retirement farming
- Frost and other difficulties in keeping trees alive
- No mechanization which requires a high amount of labor input

II. Establishing an Orchard

This section explores how respondents started their chestnut orchard, inquiring about both types of plants used and tasks performed to prepare the orchard.

Half started their orchard by purchasing seedlings, 31% by purchasing grafted cultivars, 13% bought a previously established orchard and two respondents did a combination of seedlings and their own grafting. Note that all those who originally purchased seedlings had to buy grafted cultivars to restock their orchard after the initial seedlings did not properly grow.

Figure A.3: How Respondents Started Their Orchard

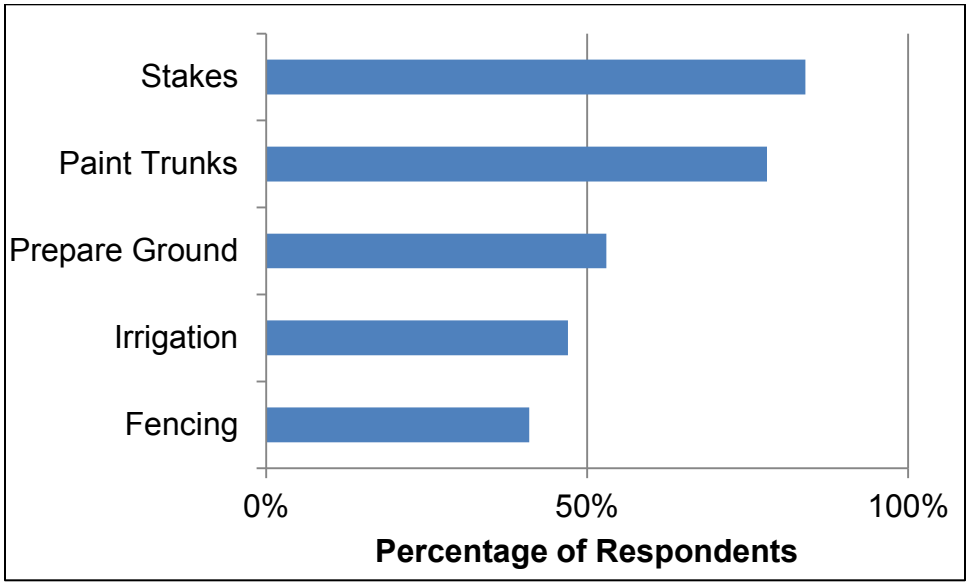


In response to how respondents restock their orchard, there was no uniform way reported. Typically respondents either purchase grafted cultivars exclusively or purchase grafted cultivars and use seedlings to do their own grafting. Only one respondent exclusively purchases seedlings.

Almost all of the respondents restock their orchard with cultivars. Half use either seedlings exclusively or both seedlings and cultivars. Cultivars average double the price of seedlings at $17 versus $8.50.

The following activities are performed by the farmers to prepare new land for chestnuts:

Figure A.4: Tasks Performed to Prepare Orchard



Farmers on average do three out of the five tasks listed above to prepare the land. Of the respondents, 19% perform all of the five tasks and 16% only perform one of the five tasks.

It is necessary for most farmers to protect their chestnut trees from various natural risk factors such as deer and other small animals, sun scald, and blight. These unavoidable risk factors are why respondents performed an average of three of tasks listed above. Cost is a major factor as some of the tasks are more expensive than others, which is why most farmers (80%) perform the basic and cheapest tasks of painting the trunks and installing stakes around the trees.

III. Orchard Management

This section asked farmers about the normal tasks they performed to maintain their orchards, number of trees lost and replaced per year and how important frost is as a risk factor to chestnut farmers.

As stated explicitly by a few respondents in their surveys, chestnuts are a high labor input crop. Although the co-op recently purchased new harvesting equipment, all of the tasks required to maintain a healthy orchard requires many labor hours. Table A.1 provides an overview of the main tasks performed in this upkeep. Mowing, pruning and fertilizing are the most commons activities. Although the data was incomplete and highly variable on the total cost for each activity, fertilizer was reported as on average being the most expensive task performed compared to mulching which was relatively inexpensive.

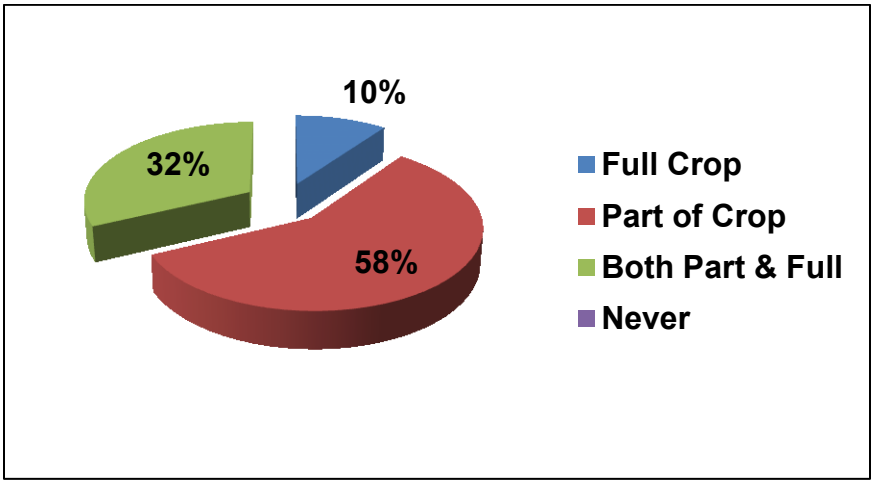
Table A.1: Orchard Activities Performed

Activity	% Performed	Frequency
Mowing	97%	Varies from 3-52 times/yr.
Pruning	88%	1-2 times/yr.
Fertilizer	84%	1-2 times/yr.
Pesticide	59%	2-3 times/yr. as needed
Trimming	56%	1-2 times/yr.
Mulching	25%	1 time/yr.
Herbicide	63%	2-3 times/yr.
Irrigation	41%	Highly variable

On average, famers lost 10 trees last year (2009). To compensate for these loses, farmers replaced/added roughly 20 trees last year. This results in an average net gain of 10 trees per year as orchards are expanding (as discussed in Section I. Tell Us about Your Farm). Note that most farmers only lost 1 or 2 trees last year but the data is skewed because one farmer lost 130 and replaced 260.

All chestnut farmers have been affected by frost. Frost is major risk factor for farmers in Michigan. To combat this ever-present risk, farmers have installed irrigation systems and tested new growing methods (such as elevating the roots). These practices are meant to protect the chestnut trees from frost and smooth out the highly volatile yearly crop yield as discussed in the next section. Figure 6 details how serious a risk factor frost is for chestnut farmers.

Figure A.5: Crop Lost Due to Frost



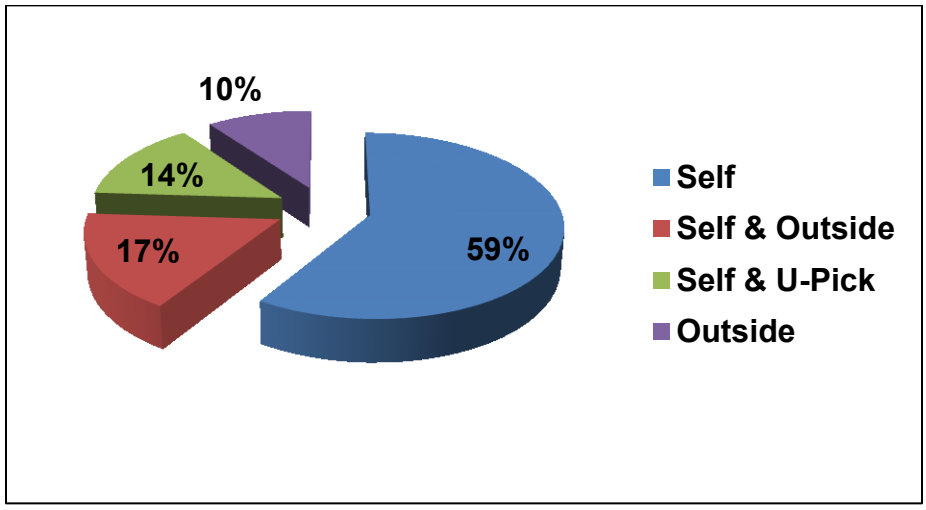
IV. Chestnut Harvest

This section explores harvesting methods, harvesting frequencies and harvesting yields. It is important to note that only 28 out the 32 farmers are actively harvesting. The average harvest season is 25 days.

Almost half (46%) of harvesting respondents spend 7 days a week picking. However, these people average only 2 hours per pick. The other 54% of harvesting respondents spend 2.5-3.5 days a week picking and they average roughly 7-8 hours per pick. Days per week slightly varies through the harvest season (peaking in the middle), hours per pick is more variable with period of harvest also peaking in the middle

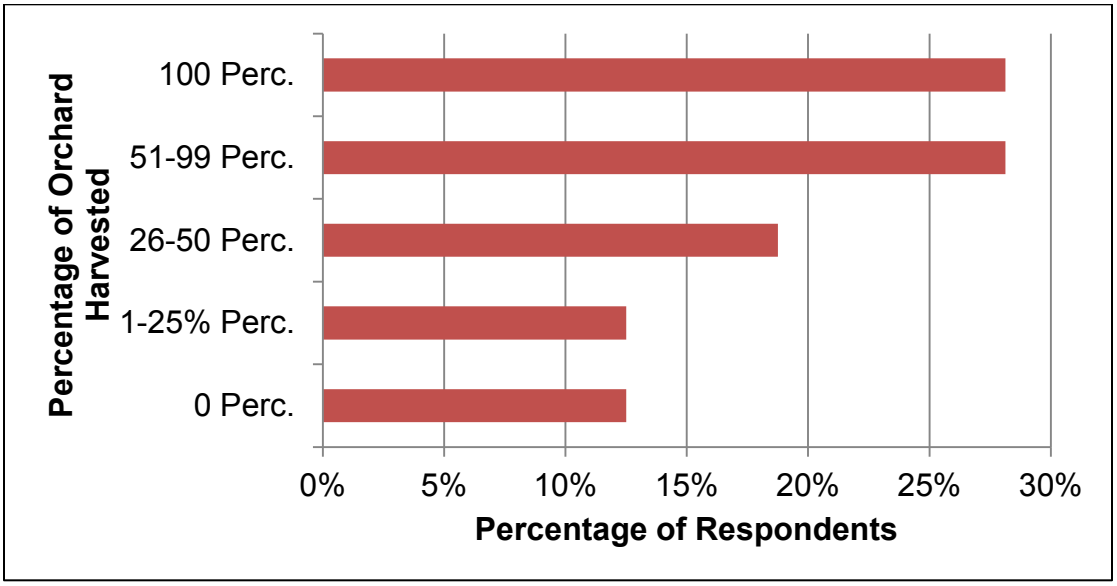
With the lack of established (and cheap) harvesting equipment, all the harvesting is performed by hand. 90% of farmers perform harvesting by themselves while the other 10% exclusively use outside labor. It is important to note that how the harvest is performed is not correlated with chestnut orchard size. The next graph displays harvesting methods.

Figure A.6: Harvesting Methods



In terms of percentage of orchard harvested, remember that 12.5% of respondents are not harvesting. Figure A.7 outlines the distribution of percentage of orchard harvested by respondents in 2009.

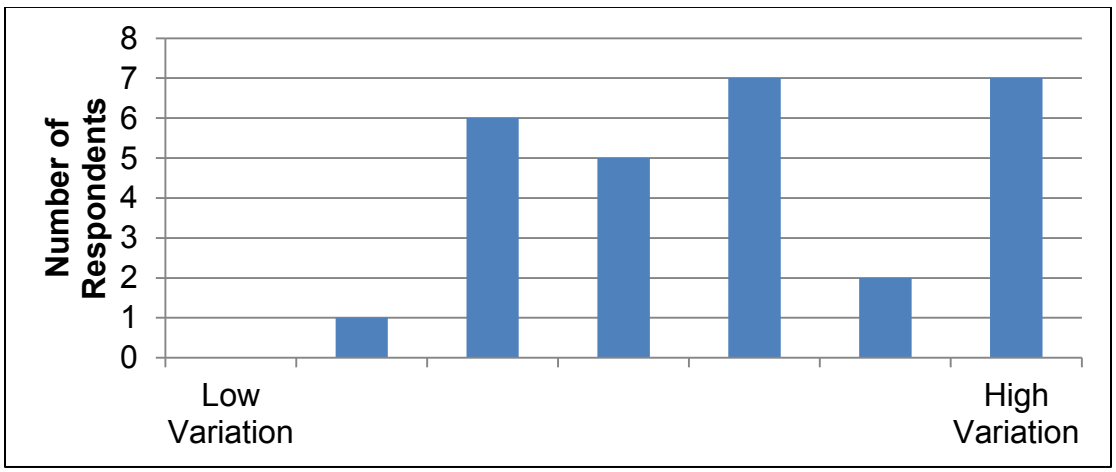
Figure A.7: Percentage of Orchard Harvested



The average yield for the last three years was 1,300 lbs. per farmer. Comparing this number to the yield expected for this harvesting season; 42% are expecting a lower crop yield with frost cited as the primary reason, three respondents are expecting zero yield this season due to frost, while 47% are expecting a larger yield than average.

Respondents reported a relatively high yield variation year to year. On a 7 point Likert[15] scale (1 is low variation and 7 is high variation), the average response was 4.87, indicating high yearly variation.

Figure A.8: Variation in Yield: Year to Year



[15] See footnote 11 for an explanation of the Likert scale.

V. Chestnut Marketing & Packaging

This section addresses how respondents package their chestnuts, different products produced, and market outlets where they sell their chestnuts.

Grading:
66% of respondents self-grade their chestnuts, either using a shaker, floating or using a size grader to judge the quality of each chestnut. On average, farmers rate their chestnuts as high quality with a score of 5.63 on a 7 point scale. This quality does not vary significantly either year to year or within one harvesting season as respondents reported low variation in both of these categories.

Storage:
80% of farmers store their chestnuts on farm for roughly one week and at most up to one month. 90% of respondents wash their chestnuts before storage. Half use only water while the other half use a combination of water and Storox/Clorox.

Transportation:
All (except 4 farmers) transport their chestnuts with their own truck. The four exceptions sell their entire product on farm or share transportation with another producer. The average price of transport is highly variable with a rough average of $100 skewed towards the smaller values. However, a few respondents explicitly wrote on their survey that transportation was a major cost deterrent in their participation in the co-op. To transport, famers use either crates supplied by receivers or different size bags:

- 35% use crates
- 55% use a variety of different size bags to package their chestnuts
- 5% uses a combination of crates and individual sales
- Average cost for packaging difficult to discern, mainly in $10-$20 range
    - CGI takes care of packaging costs for all non on-farm sales

Advertising:
23% of respondents advertise. All of these respondents generated positive income from their chestnuts. They all use a variety of advertisements with website, roadside signage, newspaper and roasting/demonstration cited as the most popular.

Value-Added Products:
Of those selling chestnuts, only 2 respondents (8% of those selling chestnuts) sell value-added products. These include; chestnut flour, frozen peeled chestnuts, gift packs, cherry chestnut salsa and chestnut slices. All but one of those selling chestnuts

sell fresh chestnuts in bulk (this respondent sells fresh chestnuts packaged). Most of the respondents (60%) sell only fresh chestnuts in bulk.

Sales Outlets:
Table A.2 details the actual outlets that each farmer sells to. As shown in the table, most farmers sell to CGI and directly on the farm. The highest average prices received however are from farmers markets and online direct to customers.

Table A.2: Current Sales Outlets

Ranking	Outlet	% Farmers	Avg. Price Received
1	Chestnut Growers Inc.	72%	$1.50
2	Direct on farm sales	41%	$2.50
3	Farmers market	24%	$5.00
4	Upscale grocery stores	14%	$3.00
4	Wholesalers	14%	$2.50
4	Restaurants	14%	$3.50
7	Other (usually u-pick)	10%	N/A
8	Distributor	4%	$3.00
9	Online, direct to customers	4%	$5.50

Note that although many farmers sell to different outlets, they sell the largest percentage of their harvest either to CGI on directly on the farm. Only a few respondents sell exclusively to higher end outlets such as upscale grocery stores or restaurants.

The next survey question inquired as to respondents desired sales outlets by ranking each individual's top five choices (1st choice vote receives 5 points). Congruent to the previous table, CGI and direct on farm sales were the most popular followed by farmers markets. This can be due to a general lack of knowledge/exposure to other sales outlets. This also highlights the general hope among CGI cooperative members that CGI will lever its size and create profitable contracts with the other more profitable sales outlets.

Table A.3: Desired Sales Outlets

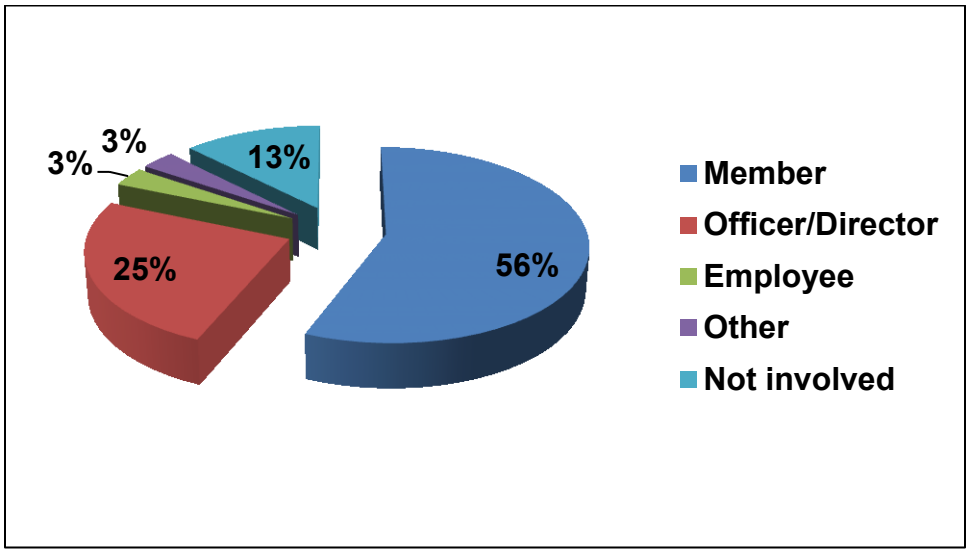
Ranking	Outlet	# of Points	% Voted
1	Chestnut Growers Inc.	96	74%
2	Direct on farm sales	82	68%
3	Farmers market	49	45%
4	Upscale grocery store	26	26%
5	Wholesalers	24	19%
6	Restaurants	22	26%
7	Individual reseller	18	19%
8	Distributor	16	16%
9	Ethnic store	15	13%
10	National chain grocery store	13	16%
10	Other farm's outlet	13	13%
12	Health store	12	16%
12	Nursery	12	10%
12	Discount grocery store	12	13%
15	Online, direct to customers	9	13%
16	U-Pick	7	6%
17	Catalog sales	5	3%

VI. Attitudes Regarding Cooperatives

This section attempts to gauge the farmers' perceptions of cooperative in general and their specific feelings and perceptions of their own cooperative, CGI.

Of the 32 respondents involved in the survey, 82% (26 people) are members of the cooperative. Figure 12 provides a graphical breakdown of group membership. Note that of the 26 people in the co-op, eight are directly involved in the leadership of the cooperative.

Figure A.9: Respondents' Participation Levels in CGI



The average length of involvement for each group member is 7.5 years. The co-op was founded 10 years ago and 58% of the self-identified group members have been involved since the group's inception. There are three other different recruiting cycles as the remaining cooperative members joined either 2, 5, or 7 years ago.

In response to whether group members would seek out another co-op if CGI shut down, respondents were unlikely to find a new co-op. On a 7 point Likert scale, the average response was 5.26 (1 being very likely to seek another co-op and 7 being very unlikely to seek another co-op); 37% are extremely unlikely (score of 7) to seek another co-op, 9% are indifferent (score of 4), and 11% are very likely (score of 1) to seek another co-op (note that all of these individuals are directly involved in the management of CGI.

Table A.4 provides the average response to each question and the variance of respondents answers. Using a 7 point Likert scale, a score of 1 implies that respondents

strongly agree with the statement and a score of 7 implies that respondents strongly disagree with the statement.

Table A.4: Respondents' Perceptions of General Cooperatives

	Strongly Agree						**Strongly Disagree**	**Variance**
	1	**2**	**3**	**4**	**5**	**6**	**7**	
Are the lifeblood of the rural community			3.6					3.1
Have outlived their usefulness						6.1		1.3
Need to become more business oriented			3.3					2.9
Have forgotten how important their members are				4.8				3.8
Will be successful only if they compete on the basis of price				4.4				3.1
Are of little value to the large farmer					5.5			2.6
Should listen to members more			3.7					2.9
Should not tolerate the financial setbacks of some members that place a burden on the rest of the members			3.4					1.8
Are struggling to find their niche in agribusiness				4.0				3.4
Should focus more on strengthening the social fiber of our community					5.0			1.5
Are of little value to the small famer					5.4			3.9

This table shows that in general, respondents believe that cooperatives should become more business oriented. In line with this point of view, co-ops should also not support members that are struggling financially as this would put too much of a burden on other group members. There is slight agreement that cooperatives are essential to rural communities. This point of view is congruent with the respondents' perception that co-ops are of large value to the small farmer but of little value to large farmers. In sum, respondents believe that cooperatives are still important and have not outlived their usefulness but these organizations should be more business oriented, as aspects such

as community involvement are unimportant to survey respondents. The next set of questions asked respondents their specific perceptions about Chestnut Growers Inc.

Table A.5: Group Member Perceptions of CGI

	Strongly Agree						**Strongly Disagree**	**Variance**
	1	**2**	**3**	**4**	**5**	**6**	**7**	
I receive a fair price for my chestnuts				4.5				2.1
I do not feel a sense of belonging to CGI					5.1			4.2
The voting rights and procedures are fair and equitable			2.6					2.7
I feel included in the decision-making processes of CGI				3.1				3.2
I do not feel like a part of the family at CGI						5.7		3.1
I feel I have too few options to consider leaving CGI				4.8				4.3
In general, I have invested a great deal of myself into CGI				3.3				3.0
I have not given much of my time or effort to CGI and its success or failure				4.7				5.0
Management makes me feel that my opinions are valued				3.0				3.1
I do not feel emotionally attached to CGI				4.4				4.4
In general, I believe that what happens to me is my own doing			2.2					2.1
CGI has a great deal of personal meaning for me				3.6				3.2
It would be very difficult for me to leave CGI now even if I wanted to				4.1				5.0
If I had a choice, I would never have invested in a chestnut orchard						5.5		3.4

In general, group members feel a sense of belonging to CGI. The cooperative fosters a strong community wherein group members feel a part of the CGI family and directly involved in the fair and equitable decision-making process of the co-op. This strong communal environment manifests itself in group members investing time and effort into CGI above and beyond group norms. Just as importantly, group members develop a psychological attachment as well (i.e. “In general, I have invested a great deal of myself into CGI”).

It is important to note that group members take on a large amount of personal responsibility (they strongly agree that they control their own destiny). This determined attitude is also apparent in the respondents’ strong disagreement with the statement, “If I had a choice, I would never have invested in a chestnut orchard”. This implies that group members are both emotionally and financially invested in seeing their chestnut orchard succeed and are willing to do whatever it takes to see if through.

The price received for their chestnuts is the single most important factor in determining a member’s participation level (i.e. how much of their crop they sell to CGI). Table A.7 shows that members believe that “Price of products or services” is very important to group members with a score of 1.5 on a 7 point Likert scale. Table A.5 shows that members slightly disagree that they receive a fair price from CGI for their chestnuts. During co-op meetings this is the main point of contention between group members. As shown in Section V: Chestnut Marketing & Packaging, CGI provides the lowest average price for the farmer’s chestnuts. This is due to many factors, but one of the most important and often cited is the lack of a consistent supply of chestnuts from group members. Because the cooperative cannot rely on a consistent supply of chestnuts, they cannot enter into long-term contracts with large retailers. Only once these contracts are established can the co-op provide a higher price to members. Although cooperatives traditionally provide services for its members as both a business and “family”, group members place the price received for their chestnuts as the single most important factor in determining member participation level and in turn cooperative strength as an organization.

The next two tables display the congruence between CGI values and group member values. Table 17 highlights the differences between what group members perceive that CGI *currently* values and what group members believe that CGI *should* value.

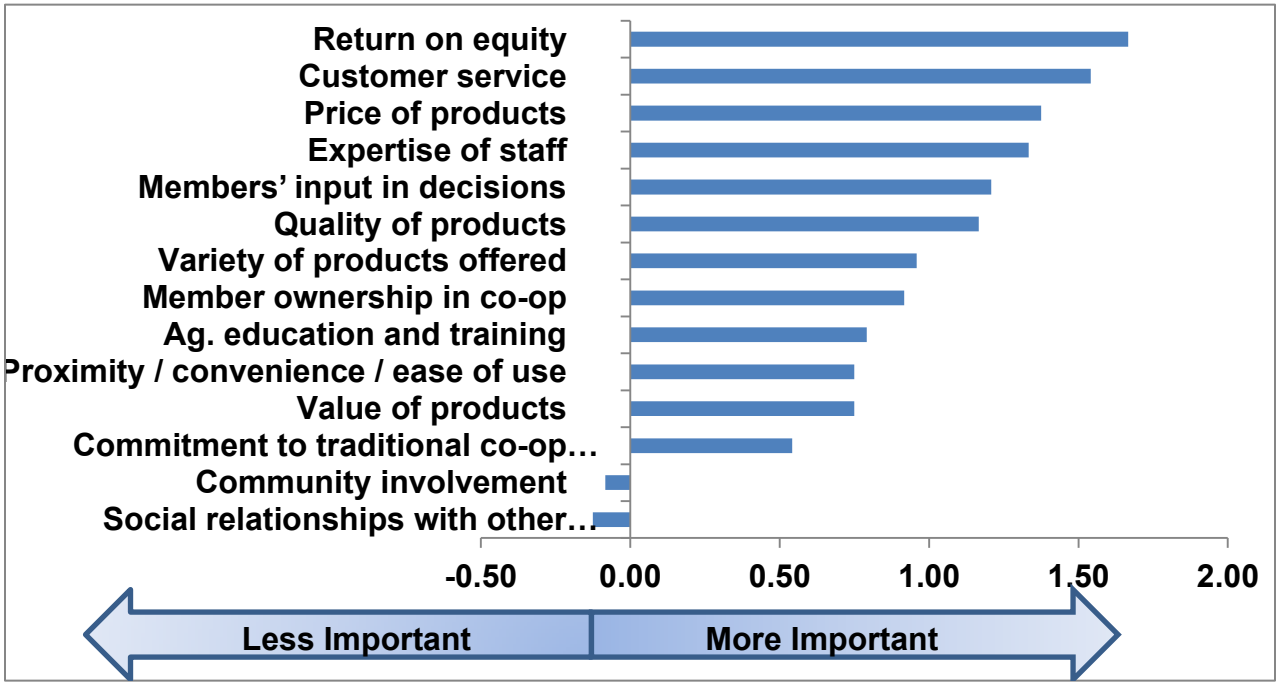
Table A.6: Group Member Perceptions of CGI's values

	Strongly Agree 1 2 3 4 5 6 7 Strongly Disagree	Variance
Price of products or services	2.8	3.0
Members' input in decision-making process	3.5	3.1
Variety of products / services offered	3.2	3.0
Customer service	3.0	2.5
Professionalism / expertise of staff	2.8	2.5
Quality of products / services	2.4	1.7
Agricultural education and training	3.6	4.6
Member ownership and control in the co-op	3.0	3.1
Proximity / convenience / ease of use	3.6	3.0
Social relationships with other members	3.8	3.8
Return on equity	3.3	5.2
Community involvement	4.2	3.5
Value of products or services	2.5	2.7
Commitment to the traditional cooperative ideals	3.3	3.1

Table A.7: Group Member Values (What the Co-op *Should* Value)

	Strongly Agree 1 2 3 4 5 6 7 Strongly Disagree	Variance
Price of products or services	1.5	0.3
Members' input in decision-making process	2.3	1.3
Variety of products / services offered	2.5	2.6
Customer service	1.5	0.4
Professionalism / expertise of staff	1.6	0.6
Quality of products / services	1.2	0.3
Agricultural education and training	2.8	3.3
Member ownership and control in the co-op	1.9	0.9
Proximity / convenience / ease of use	2.6	1.0
Social relationships with other members	3.9	2.7
Return on equity	1.6	1.6
Community involvement	4.3	2.1
Value of products or services	1.9	1.0
Commitment to the traditional cooperative ideals	2.8	2.0

Figure A.10: Dissonance Between Perceived CGI Values and Group Member Values



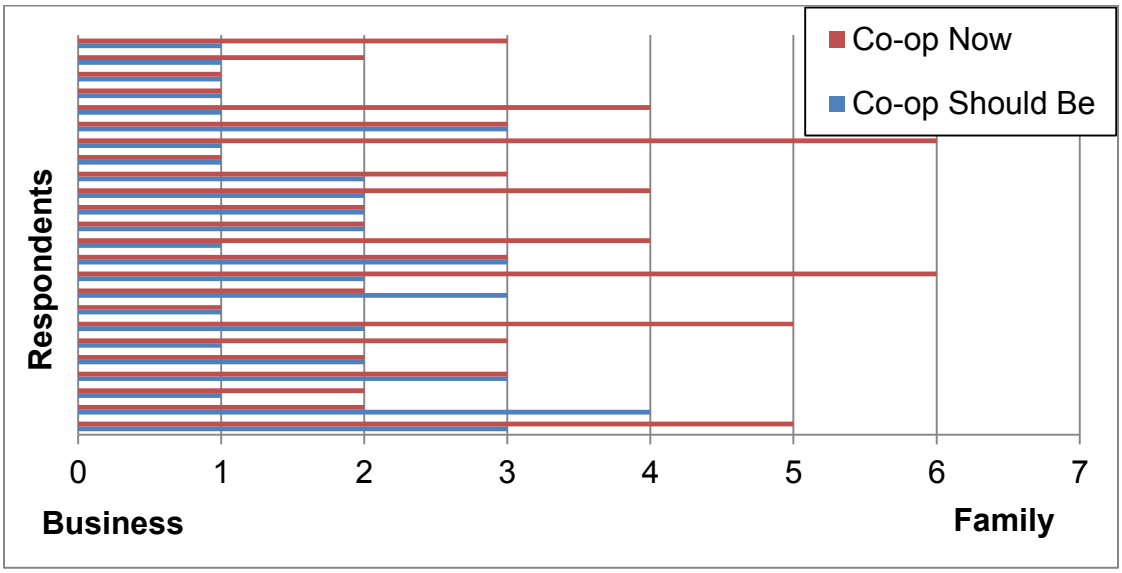
Note: A positive number for a given issue implies that group members believe that the issue should be more important to the co-op than it currently is while a negative number implies that group members believe that co-op should place less importance on that issue than they currently do.

Figure A.10 clearly shows that in general, co-op members believe that the organization is not placing enough importance on business related issues. For example, return on equity (money received by members from investments in the co-op) and price of products have the largest positive difference between what group members perceive that CGI values and what group members believe CGI should value. The only two issues that group members believe that CGI should place less emphasis on are community involvement and social relationships among the co-op. These two categories fall under the "family" aspect of a traditional cooperative as the group members do not believe that these two items should be as important to the co-op as they currently are. This theme is clearly shown in the next question, where respondents believe that the co-op should be more business oriented than in its current state. In response to the question, "Some experts have characterized co-ops as part business, part family. That is, they contain both the economic elements of a business and the social, or relational, elements of a family. On the following scales please indicate where you feel the focus of the typical co-op is currently and where you feel they should be focused. 8% want a more family focus, 50% want a more business focus, and 42% are indifferent. Group

members believe that cooperatives in general and CGI specifically should be more business focused.

Figure A.11 compares where each respondent thinks the cooperative is now (on the business vs. family scale) and where they believe the co-op should be. Note that most respondents believe that the co-op is currently more family focused than what they think the co-op should be. This is shown graphically as the red bars (where the co-op is currently perceived to be) are generally larger than the blue bars (where the co-op should be).

Figure A.11: Co-op Values: Business vs. Family



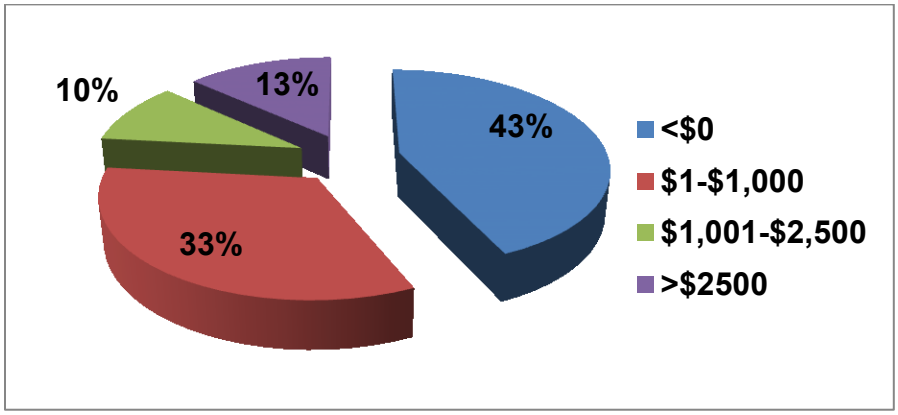
Although group members identify with the organization (as shown in Table A.5), for the organization to truly succeed it needs a consistent supply of chestnuts from group members. The co-op cannot succeed without a consistent high quality supply of chestnuts, but farmers do not have the incentives to provide this because of the low price offered by CGI. Combining this factor with the inherent risks in growing chestnuts (for example frost), the future prosperity of CGI cannot be guaranteed.

VII. Chestnut Orchard Financials

"A farmer is a businessman, and that's the bottom line." This quote from the 2010 CGI annual meeting best summarizes the primary motivating factor for cooperative members. This section addresses that issue by analyzing the profitability of each farmer's chestnut operation and explores what factors respondents believe are the most important in improving profitability.

43% of respondents reported a negative net income for chestnut production. Of the 57% of farmers generating a positive profit, 59% reported minimal net incomes of less than $1,000 from their chestnut orchard. However, those farmers with large amounts of chestnut sales (greater than $5,000) exhibited healthy profit margins of roughly 20%. This is merely a rough estimation however as proper financial analysis of each farm's accounting statements would engender a more accurate profit margin estimation. Figure A.12 details the net income breakdown for the respondents' chestnut orchards.

Figure A.12: Net Income from Chestnut Production

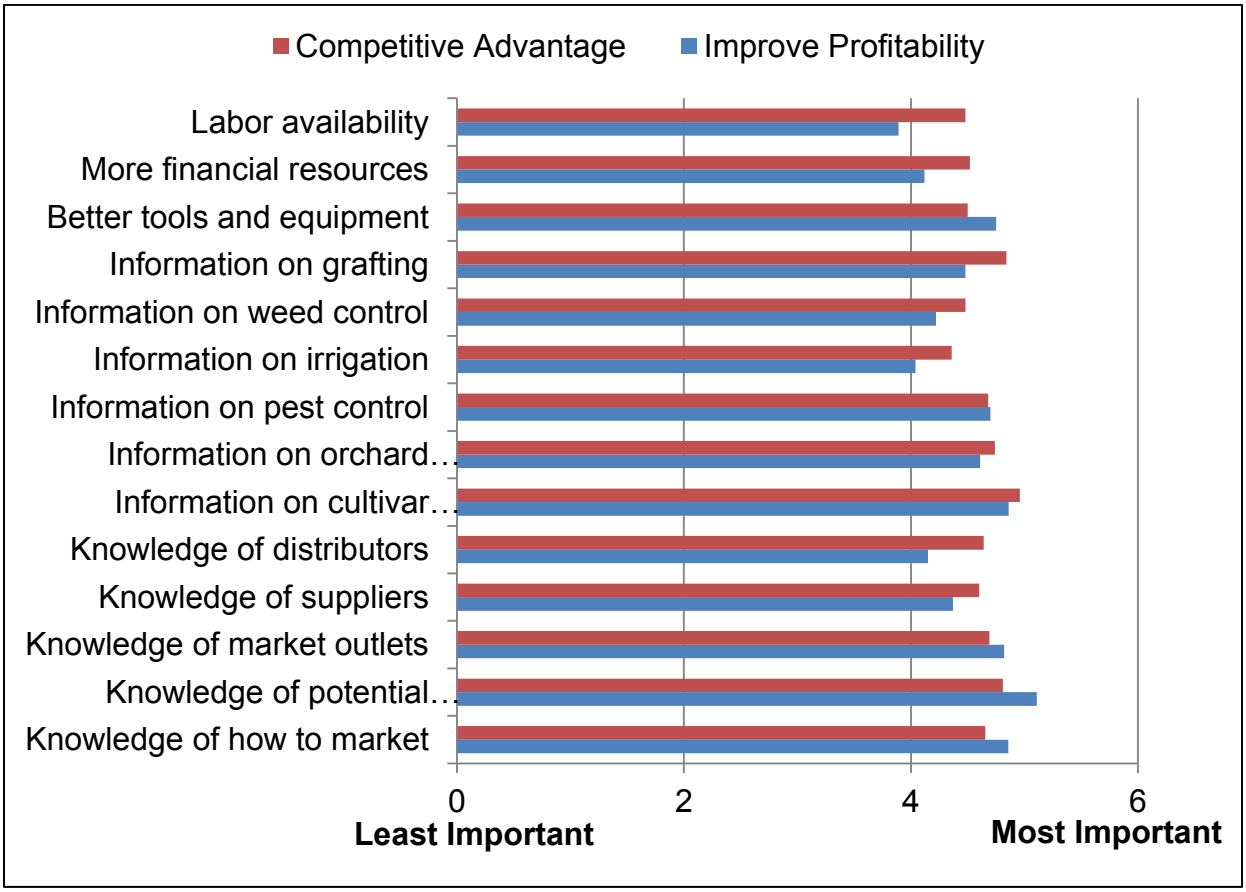


Planting a chestnut orchard is a time-intensive investment and there is a long latent period between initial planting and when trees reach full nut-bearing capacity. Respondents reported roughly 6.5 years until they received their first $100 in revenue from chestnuts, but this does not imply that the trees are fully mature in 6.5 years. On average it takes at least another year after trees begin bearing fruit until the orchard becomes profitable, although 43% are still not turning a profit.

In general this time period is longer than the farmer's original expectations, with only one reporting shorter than expectations. Also, farmers are very optimistic in their prediction for future chestnut prices with 86% expecting the wholesale price of chestnuts to rise in the future.

Lastly, this section addressed what critical factors respondents deemed necessary to improve the profitability of chestnut production and the competitive advantages shared by successful chestnut producers.

Figure A.13: Important Factors in Improving Profitability and the Factors Which Are the Competitive Advantages of a Successful Chestnut Producer



In general, farmers perceive production and distribution as the most important determinants in both improving profitability and what composes a farmer's competitive advantage. For example, knowledge of potential buyers, information on cultivar selection and information on grafting had the highest average aggregate scores. According to this survey, respondents do not believe that labor availability and knowledge of distributors are important determinants of improving profitability.

Appendix Exhibit A.4: Interview Questions Template

Date _____
Interviewee _____

First, I would like to mention that this interview is a continuation of the survey we first sent out where we are trying to understand methods to increase performance of CGI. For this interview I would just like to have an informal conversation with you about the co-op. This is not meant to be a test, there are no right answers and I just want to get your opinion on a few questions. Some questions you may not believe are relevant but I would still appreciate your feedback. It is important that I reiterate that this interview is confidential, I will not share you answers with anyone else and you do not need to answer all of the questions.

Demographics:
First I would just like to verify some demographic type questions from our initial survey.

1. How large is your farm (acres)?
    a. How many acres are dedicated to chestnuts?

2. How many hours of your total farming time did you devote to your chestnut orchard?

3. What was your harvest yield last year?
    a. Expected yield this year?
    b. Average yield last five years?

4. What percentage of your last harvest do you give to CGI?
    a. Expected percentage this year?
    b. Average percentage of last five years?

Measuring Group Social Capital:
Next I would like to ask you a few questions about your general relationships with the other cooperative members.

1. Do you associate with co-op members outside of business transactions (outside of co-op business)?
    a. Are you members of the same social groups (i.e. church, rotary club, etc.)?
    b. Are your children involved in the same activities?

2. Do you perform any other business with the other co-op members outside of CGI?
    a. Buy fertilizer together
    b. Share equipment

3. Are you related to any of the other co-op members? Are you connected to other co-op members through marriage or though the associations of your children?

4. Do you share the same political philosophy/worldview as most other co-op members?

Next I would like to ask you a few hypothetical questions, try not to think too hard about your answer and just tell me the first thing that comes to mind.

1. If you had a wedding, would you invite other cooperative members? If yes, how many? How many do you think would attend?

2. If another cooperative member had a wedding, do you think they would invite you? Would you attend if invited?

3. If you became sick for a long period of time (more than a month), would you expect other co-op members to sincerely offer to help run your farm or in other ways assist you maintain your business?

4. If another co-op member became sick for a long period of time, would you take care of their farm or in other ways offer substantial help if asked?

5. If your car broke down and you needed a ride to the next annual co-op meeting, would you ask one of your other co-op members for a ride? How far do you think they would be willing to drive you?

6. If one of your fellow co-op members needed a ride to the next annual co-op meeting, would you offer them a ride? How far would you be willing to drive to pick them up?

7. What if another co-op member was suffering a short-term emergency, would you offer them a personal loan? What would the amount be?

8. What if you needed a short-term loan because of an emergency. Do you think another co-op member would offer you a loan? How much?

The next set of questions relates to prices.

1. If the cooperative offered the same price as other outlets (i.e. on farm, farmers market) for your fresh chestnuts, how much of your crop would you sell to the cooperative (percentage)?

2. Let's say that your local farmers market is offering $3/lbs. for your fresh chestnuts, what is the minimum price that the co-op would have to offer you so that you give them the same amount of chestnuts you currently do?
   1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75

3. On a scale of 1 to 10, if the cooperative offered you a fixed price at the end of harvest for your chestnuts, how would this affect your behavior?
   Give Less Nuts Give More Nuts
   1 2 3 4 5 6 7 8 9 10

4. On a scale of 1 to 10, how would a tiered compensation scheme based on the *quality* (higher quality, higher price) of nuts given to the co-op affect your behavior?
   Give Less Nuts Give More Nuts
   1 2 3 4 5 6 7 8 9 10

5. On a scale of 1 to 10, how would your behavior change if the co-op offered you an increased price if you gave a larger quantity (percentage) of nuts?
   Give Less Nuts Give More Nuts
   1 2 3 4 5 6 7 8 9 10

6. Would you prefer to receive $3 for chestnuts upfront from CGI, or wait for the potential of sales to chefs or restaurants wherein the price would be either $2 or $4 with equal probability?

Economic Incentives:

1. On a scale of 1 to 10, how would access to CGI harvesting equipment affect your behavior?

Give Less Nuts									Give More Nuts
1	2	3	4	5	6	7	8	9	10

2. How much closer to CGI's processing facility would you have to live to change your level of participation?
    a. 0 miles
    b. 10 miles
    c. 30 miles
    d. 100 miles
    e. 200 miles

3. On a scale of 1 to 10, if CGI offered a pick-up service wherein they would pick-up your clean and sorted chestnuts, how would this affect your behavior?

Give Less Nuts									Give More Nuts
1	2	3	4	5	6	7	8	9	10

4. How would you feel if you were legally obligated (through cooperative by-laws) to sell part of your harvest to CGI? Would you still want to be part of the co-op?
    a. Do you think members should be forced out of the cooperative if they do not give any nuts to the co-op?

5. Let's say that at the end of the harvest this year, you had 100 pounds of chestnuts. How would you allocate these chestnuts between fresh and value-added (i.e. chestnut slices, flour or frozen peeled chestnuts)?
    a. How would you expect to allocate 100 pounds of chestnuts in 5 years?

Access to knowledge/expertise:

1. Do you implement the harvesting methods and/or cultivars suggested by Dr. Fulbright?

2. Do you value the knowledge provided by the MAES and Mario Mandujano?

3. On a scale of 1 to 10, how much do you trust the leadership of CGI to act in the best interest of CGI? (Remember that all questions are confidential)
    a. To act in the best interest of you?

Access to markets:

1. If the co-op developed new markets (i.e. restaurants or supermarkets), how would this change your behavior?

2. What do you think is the future of the CGI, fresh chestnuts or other chestnut related products (chestnut slices, flour and peeled frozen chestnuts)?

Legitimacy:

1. Do you think CGI is an established brand name?

2. Is it easier for you to market your chestnuts individually or through the co-op?

3. Do you receive higher return as a member of the co-op or not?
    a. If no, then why are you a member of the co-op?

Summary:

1. What do you believe is the purpose/goals/mission of CGI?

2. Do you agree with this purpose/goals/mission of the co-op?

3. What do you think the goals of the co-op should be?

4. How would you evaluate the performance of your farm?
    a. Of CGI?

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