Survey of Midwest Chestnut Growers: A Qualitative Overview

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Summary: The following report provides a qualitative overview of the "Survey of Midwest Chestnut Growers". The survey was administered exclusively to 32 chestnut farmers associated with Chestnut Growers Inc. (CGI), a cooperative based in Southwest Michigan. The report outlines the characteristics of chestnut farmers, their typical production and marketing practices, profitability of the chestnut operations and group members' perceptions of CGI. Important conclusions include that chestnut orchards are currently minimally profitable, however as operation size increases the potential for achieving healthy profit margins exists (20%). Also, CGI has the potential to succeed as a co-op as group members identify strongly with the organization, but their actions do not support their positive perceptions of the organization. The combination of inherent risk factors in chestnut production (frost) and a lack of a consistent supply of quality nuts to the co-op threatens the growth and future profitability potential of CGI.

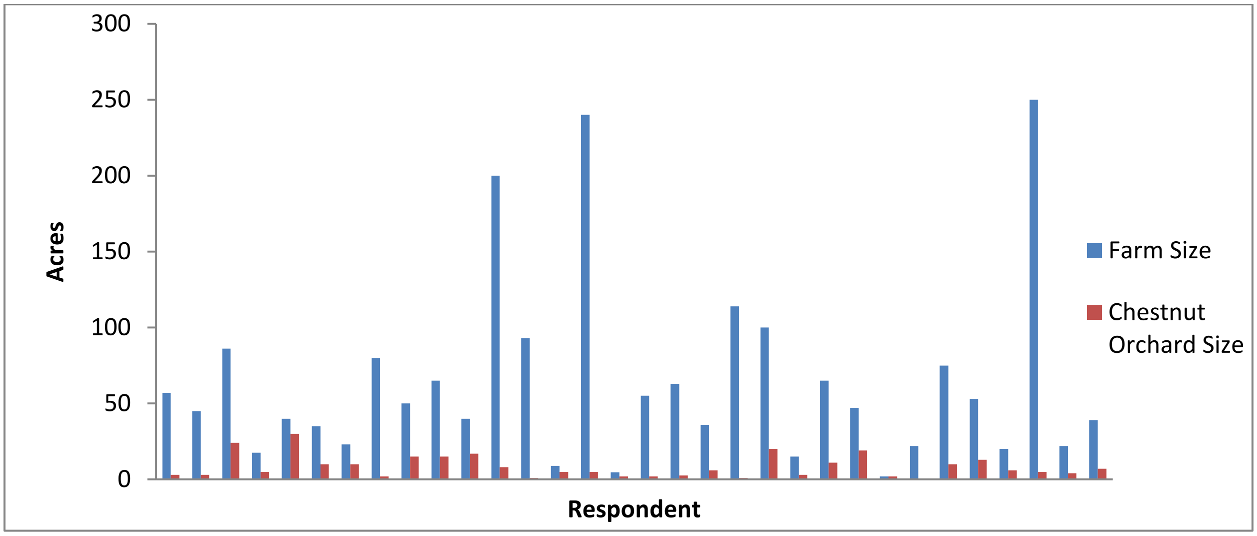
I. Tell Us About Your Farm

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 anyway. The number of respondents is 32 (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.

Exhibit 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 respondents harvesting chestnuts as a retirement hobby and that many chestnut orchards are still growing and are not yet fully developed and therefore not turning a profit.

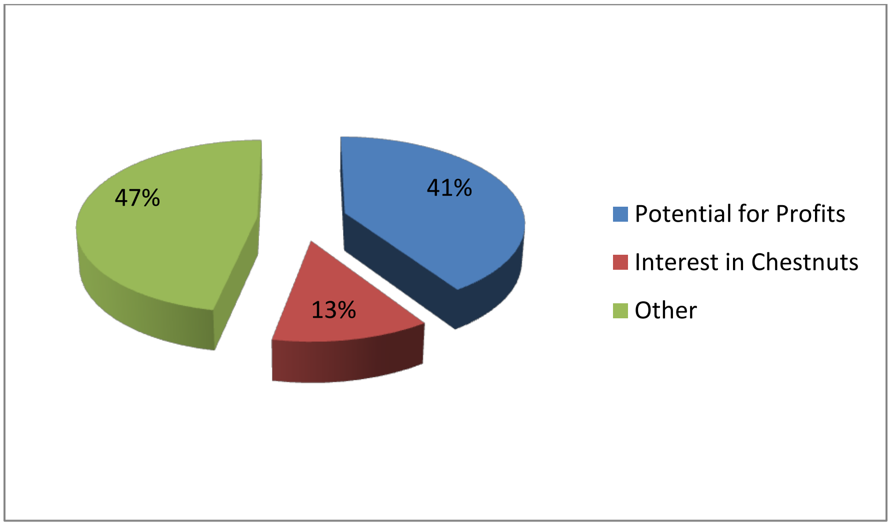
Roughly 50% of the respondent's farm activity time is dedicated to chestnuts. This question helps break down survey respondents into two subgroups, wherein attendees at the conference averaged 60% while the mailed-in responses averaged significantly less at 40%. This may be correlated with interest in attending meetings as mailed-in respondents see chestnuts as more of a hobby/retirement not cash crop. There is also a slight correlation between time spent on chestnuts and percentage of farm dedicated to chestnuts

On average, farmers reported a chestnut tree density 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. Note that farmers have been growing chestnuts for either 5-8 years or mostly 15 plus years which denotes two different generations of growers who either established in the 1990's or early 2000's

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 mostly because of potential for profit (40%), alternate source of retirement income, low maintenance crop 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.

Exhibit 2: Initial Attractions to Chestnuts



Respondents are very bullish on 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 respondents cited lack of general knowledge about chestnut production or uncertainty of the chestnut market. Many other alternate explanations were cited such as:

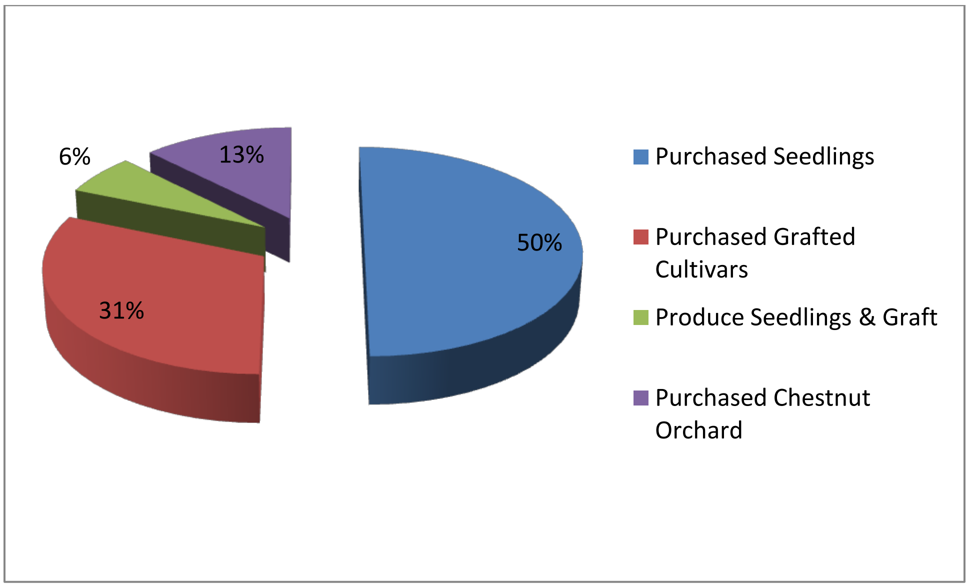
- "lack of profitability"
- "lack of economic analysis"
- Age of farmers/hobby farming
- Frost and other difficulties in keeping trees alive
- No mechanization which requires a high amount of labor input

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 instead after the seedlings did not properly grow

Exhibit 3: How Respondents Started Their Orchard

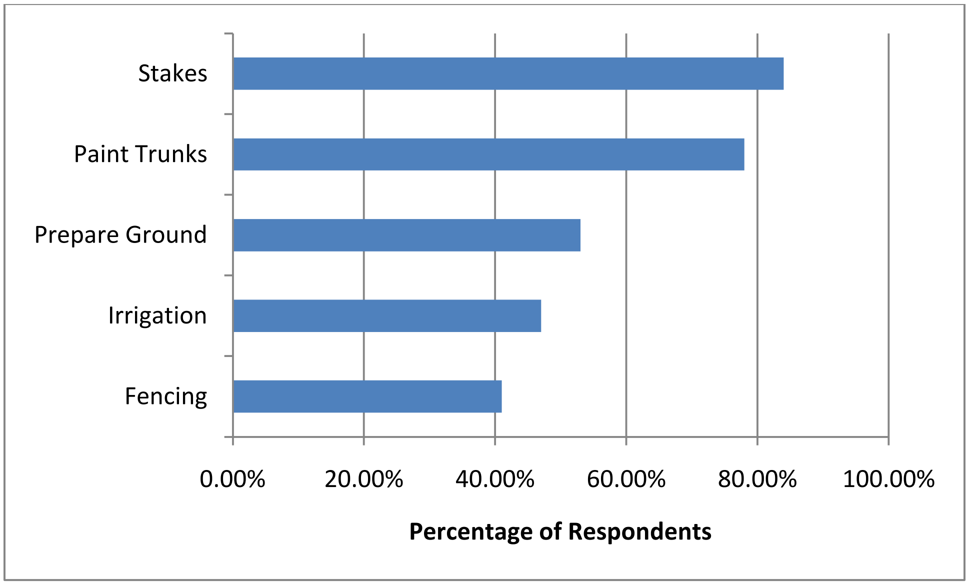


In response to how respondents restock their orchard, there was no uniform way reported. Typically respondents either purchase grafted cultivars exclusively or purchase grafted cultivars and use seedlings to do their own grafting. Only one respondent exclusively purchases seedlings.

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:

Exhibit 4: Tasks Performed to Prepare Orchard



Farmers on average do three out of the five tasks listed above to prepare the land and:

- 6 respondents complete all 5 tasks
- 5 respondents only do only 1 of the 5 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 which is why on average the respondents performed three of the above tasks. Some of the tasks are more expensive than others which is why most farmers (roughly 80%) paint the trunks and install 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.

The following table summarizes the activities performed by farmers on a frequent basis:

Exhibit 5: Orchard Activities Performed

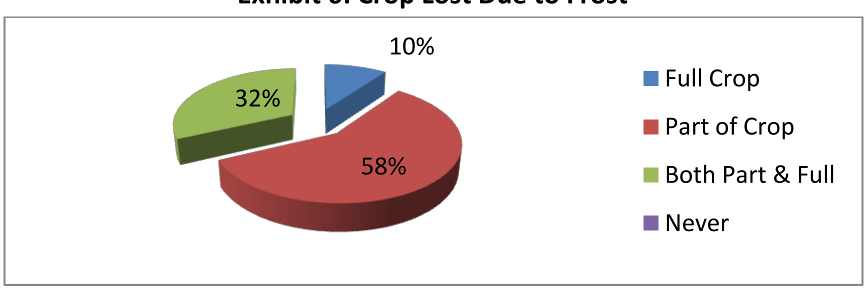
Activity	% Performed	Frequency
Mowing	97%	Varies from 3-52 times/yr
Pruning	88%	1-2 times/yr
Fertilizer	84%	1-2 times/yr
Pesticide	59%	2-3 times/yr as needed
Trimming	56%	1-2 times/yr
Mulching	25%	1 time/yr
Herbicide	63%	2-3 times/yr
Irrigation	41%	Highly variable

As stated explicitly in a few 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. The above table 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.

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 difference between number of trees added and number of trees lost 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 issue for farmers in Michigan. To combat this ever-present risk, farmers have installed irrigation systems and new growing methods such as elevating the roots are being developed to protect the chestnut trees from frost and smooth out the highly volatile yearly crop yield as discussed in the next section. The subsequent pie chart details how serious a risk factor frost is for chestnut farmers.

Exhibit 6: Crop Lost Due to Frost



IV. Chestnut Harvest

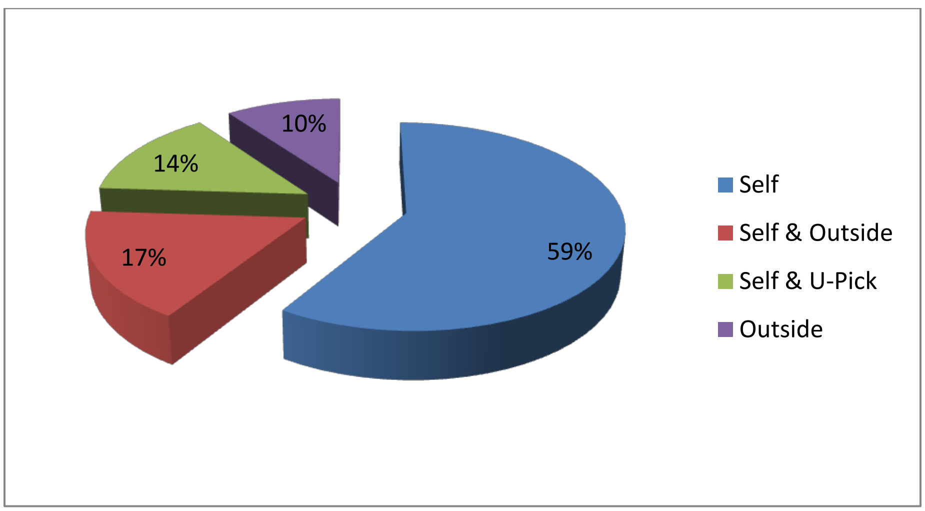
This section explores harvesting methods, harvesting frequencies and harvesting yields.

It is important to note that only 28 out the 32 farmers are actively harvesting. The average harvest season is 25 days.

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

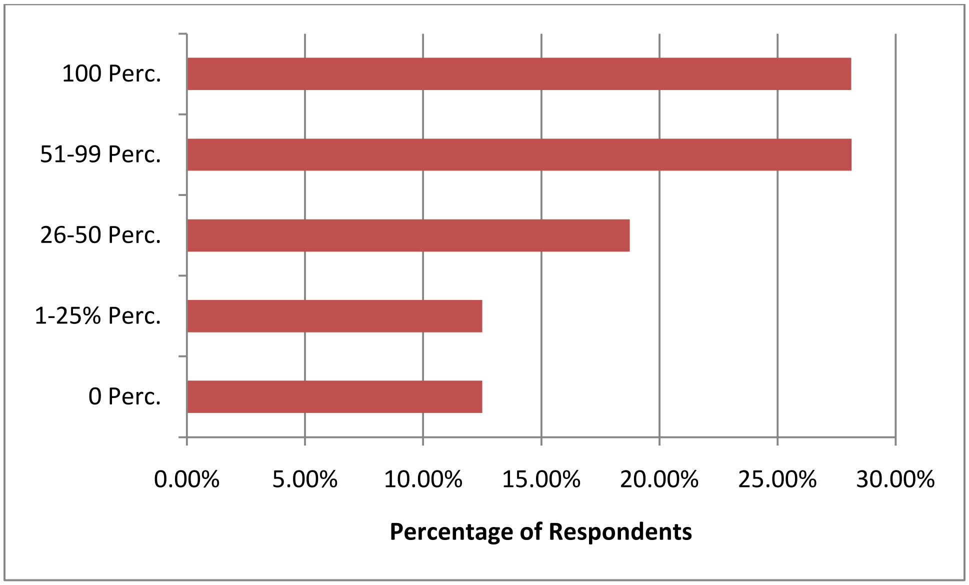
With the lack of established (and cheap) harvesting equipment, all the harvesting is performed by hand. 90% of farmers perform harvesting by themselves while the other 10% exclusively use outside labor. It is important to note that how the harvest is performed is not correlated with chestnut orchard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

Exhibit 7: Harvest Methods



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

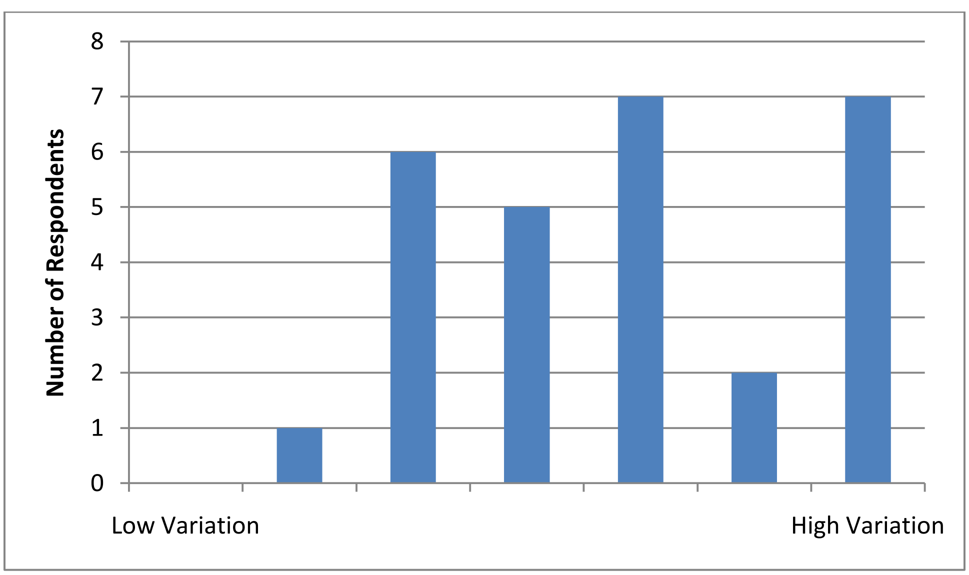
Exhibit 8: Percentage of Orchard Harvested



The average yield for the last three years was 1,300 lbs per farmer. Comparing this number the yield expected for this harvesting season, 42% are expecting a lower crop yield with frost cited as the primary reason and 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 with an average response of 4.87 on a 7 point scale indicating high variation.

Exhibit 9: Variation in Yield: Year to Year



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 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 all 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). 60% sell only fresh chestnuts in bulk.

The following table 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.

Exhibit 10: Actual 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 and the general hope among CGI co-op members that CGI will lever its size and create profitable contracts with the other more profitable sales outlets.

Exhibit 11: Desired Sales Outlets

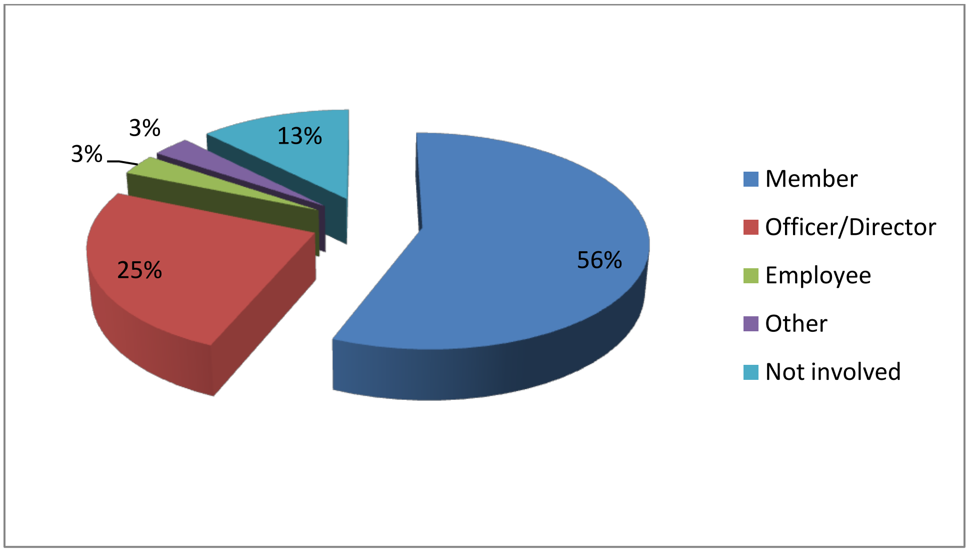
Ranking	Outlet	# of Votes	% Voted
1	Chestnut Growers Inc	96	74%
2	Direct on farm sales	82	68%
3	Farmers market	49	45%
4	Upscale grocery store	26	26%
5	Wholesalers	24	19%
6	Restaurants	22	26%
7	Individual reseller	18	19%
8	Distributor	16	16%
9	Ethnic store	15	13%
10	National chain grocery store	13	16%
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 general cooperatives and CGI.

Of the 32 respondents involved in the survey, 82% (26 people) are members in the cooperative. The next graph provides a graphical breakdown of group membership.

Exhibit 12: 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 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 (average 5.26 on 7 point Likert scale).

- 37% extremely unlikely (score of 7)
- 11% very likely (score of 1)
    - All directly involved in management of CGI
- 15% indifferent (score of 3 or 4)

The following table provides the average response to each question and variance of the answers. 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.

Exhibit 13: Respondents' Perceptions of General Cooperatives

	Strongly Agree 1 2 3 4 5 6 **Strongly Disagree** 7	**Variance**
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 respondents believe that in general, 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 a slight agreement that cooperatives are essential to rural communities. This is congruent with the respondents' perception that co-ops are of large value to the small farmer but they believe that co-ops are 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 table asked respondents about their perceptions of Chestnut Growers Inc. A score of 1 implies that respondents on average strongly agree.

Exhibit 14: Group Member Perceptions of CGI

	Strongly Agree — **Strongly Disagree** 1 2 3 4 5 6 7	**Variance**
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 the CGI organization as the co-op fosters a strong community where 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 the group members investing time and effort into CGI in addition to their psychological attachments (ie. “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 in strongly agreeing that they control their own destiny. This determined attitude is also apparent in the respondents’ strong disagreement in the statement “If I had a choice, I would never have invested in a chestnut orchard”. This implies that group members are heavily emotionally and financially invested in seeing their chestnut orchard succeed are willing to do whatever it takes to see if through.

Note that group 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 including lack of consistent supply from group members but as the co-op develops and enters into more long-term contracts with specific outlets (such as Meijers) they can start to provide a higher price for group members' chestnuts. 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 test the congruence between CGI values and group member values.

Exhibit 15: Group Member Perceptions of CGI's values

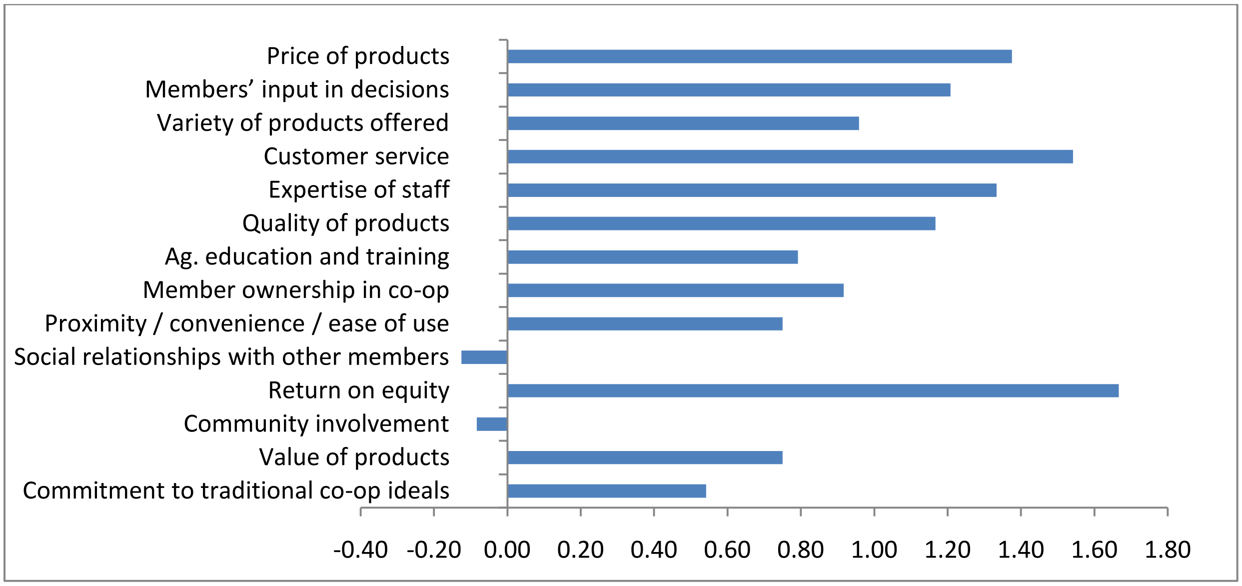
	Very Important ... Not Important 1 2 3 4 5 6 7	Variance
Price of products or services	2.8	3.0
Members' input in decision-making process	3.5	3.1
Variety of products / services offered	3.2	3.0
Customer service	3.0	2.5
Professionalism / expertise of staff	2.8	2.5
Quality of products / services	2.4	1.7
Agricultural 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

Exhibit 16: Group Member Values

	Very Important ... Not Important 1 2 3 4 5 6 7	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

The following table highlights the differences between what group members perceive that CGI *currently* values and what group members believe that CGI *should* value.

Exhibit 17: 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.

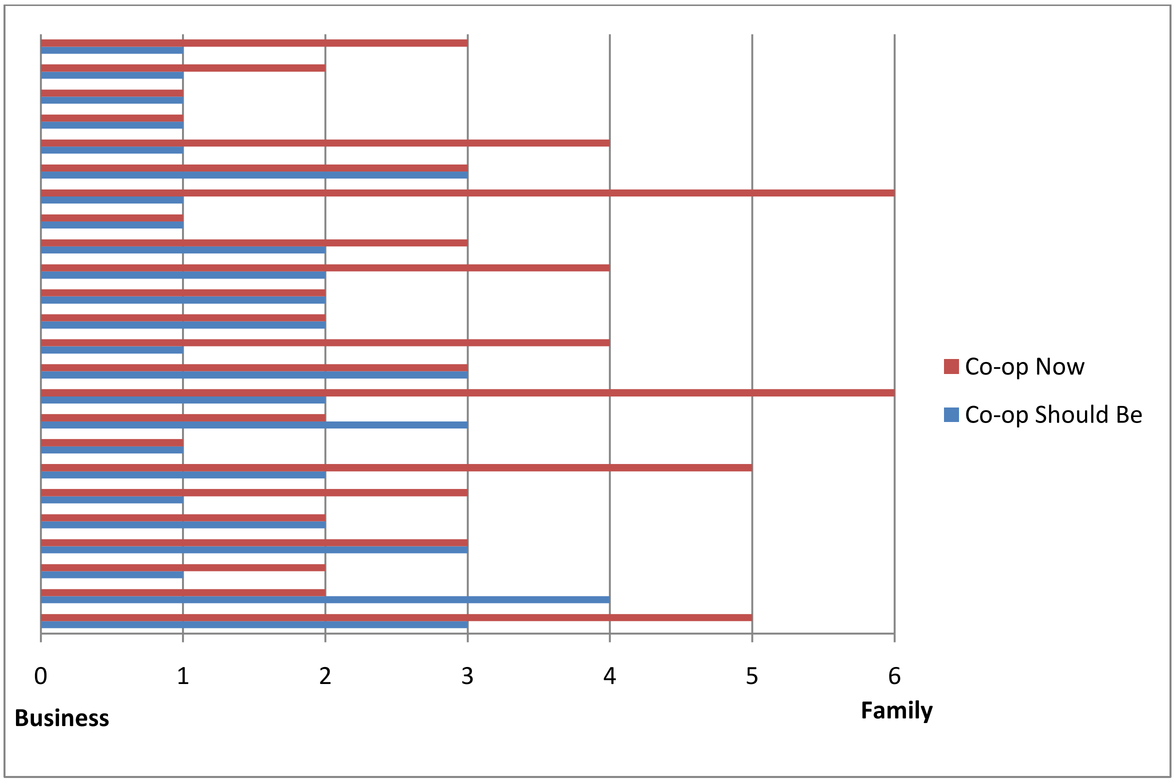
This chart clearly shows that in general, co-op members believe that the co-op is not placing enough importance on business related issues. For example, return on equity (money received by members from investments in the co-op) and price of products have the largest positive difference between what group 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 are community involvement and social relationships among the co-op. These two categories fall under the "family" aspect of a traditional cooperative and 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 seen in the next question, where respondents believe that the co-op should be more business oriented than in its current state.

- 8% want more family focus
- 50% want more business focus
- 42% are indifferent

The next graph contrasts where each respondent thinks the cooperative is now (on the business vs. family scale) and where they believe the co-op should be.

Exhibit 18: Co-op Values: Business vs. Family



Note that most respondents believe that the co-op is currently more family focused than what the respondents think the co-op should be exhibited by the difference between the red and blue lines for each response.

Although group members identify with the organization (as shown in Exhibit 14), 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 (frost), the future prosperity of CGI cannot be guaranteed.

VII. Chestnut Orchard Financials

This section addresses the profitability of each farmer's chestnut operation and explores what factors respondents believe are the most important in improving profitability.

By analyzing how large each farmer's chestnut orchard is in relation to their total farm and the sales generated from these chestnuts, we can divide our sample into three distinct subgroups; chestnut enthusiasts, hobby/retirement farmers, and large diversification farmers.

Chestnut enthusiasts

These farmers devote a large proportion of their time and farm acreage to chestnut production. However, in general most 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. All but three reported less than $5,000 in gross sales and of the 30 answering this question two respondents had zero sales.

Hobby/retirement farmers

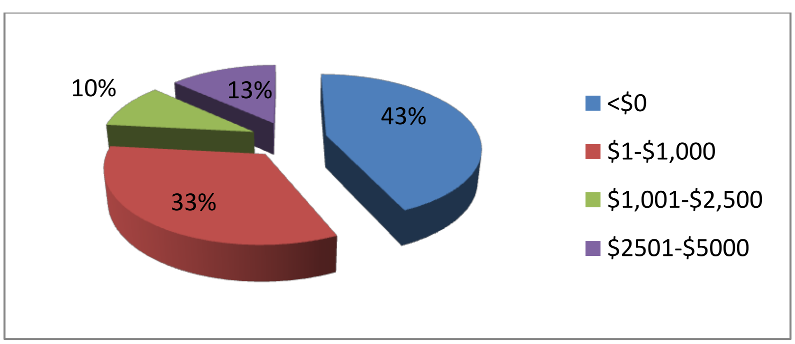
21% of respondents receive their entire farm income from chestnut production. Yet all of these respondents report less than $5,000 in gross chestnut sales. This implies that these are typically hobby farmers or they have just established a chestnut orchard.

Large diversification farmers

Only 3 reported greater than $5,000 in sales and these farmers have larger operations with chestnuts composing roughly 10% of total farm income. For these farmers chestnuts are used as a diversification tool.

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. The next graph details the net income breakdown for the respondents' chestnut orchards.

Exhibit 19: Net Income from Chestnut Production

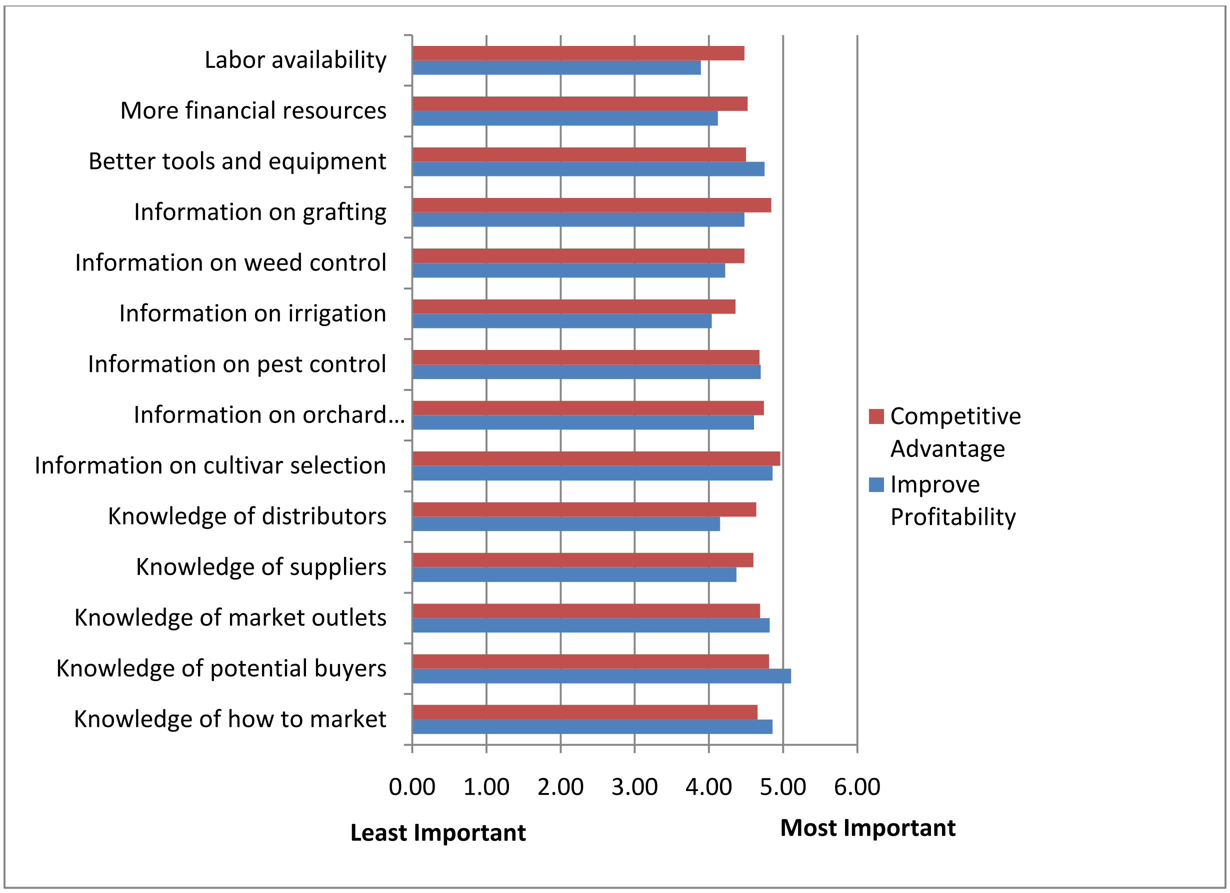


Planting a chestnut orchard is a time-intensive investment and there is a long latent period between initial planting and when trees reach full nut-bearing capacity. Respondents reported roughly 6.5 years until they received their first $100 in revenue from chestnuts, but does not imply that the trees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

In general this takes 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 were needed to improve the profitability of chestnut production and the competitive advantages of successful chestnut producers.

Exhibit 20: Important Critical Factors in Improving Profitability and Competitive Advantage



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.