Interplay of Factors Influencing Organic Vegetable Farm Profitability and Entrance Into Natural Foods Market

Brittney Manzagol

University of Colorado Boulder

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Abstract

This research examines the factors that influence profitability of organic vegetable farming and the variations between different sizes of operation. It connects the practices of farmers to the unique needs of the businesses (market businesses) who are purchasing organic vegetables. The relationship between profitable farms and market businesses were determined through results from two separate surveys. The first survey was sent to 1,500 certified organic vegetable farmers across the United States. Farm sizes from respondents ranged from 0.125 acres to 4,000 acres; and farms in this study were located in all regions of the United States except Alaska. The second survey was sent to 138 market businesses across the country. Market businesses included handlers/distributors, grocery stores, cooperatives, and farm to table restaurants; respondents were located in different geographical regions across the country.

The ultimate purpose of this research project is to provide a comprehensive resource for organic vegetable farmers on how to improve profitability. The literature review outlines traditional farm financial analysis, methods for calculating profitability, and tips from agronomists on successful business practices. The results from the two surveys outline specific business practices that lead to successful relationships between farms and market businesses, and subsequently, increased profitability. Key findings were the importance of solid business relationships, the key role of community to profitable farms, focusing on the production of quality crops, and the use of production records in the price determination process.
Preface: The Story and Passion Behind the Research

I grew up on a small organic farm in southwestern Colorado and saw my parents struggle to make the operation profitable for years. My project was inspired by the curiosity to learn if there was an easier way than trial and error to successful organic production. I wondered if my parents’ struggle to make the operation profitable was solely because of its very small size (less than 2 acres of production) or if there were other factors in play. I wanted to know the factors that were leading other farmers across the United States to profitability. I was curious if other farmer’s “success” was based on acres in production, the number of enterprises, or other factors? I wanted to know what markets “successful” farmers were selling into.

Profitability was a crucial question in my mind; at first, I wanted to ask every organic vegetable farmer in the United States to tell me profitability measurements such as: operating profit margin, net farm income, earnings before interest, etc.; expenses; in addition to all farming business practices. In the perfect study, I would have understood from a financial perspective exactly what factors could lead to profitability. However, it quickly became apparent that profitability ratios would demand considerable involvement on the part of the farms and it would have been extremely difficult, if not impossible, to determine those ratios from enough operations to create a project with statistical significance.

Luckily for me, John Hendrickson and the Center for Integrated Agricultural Systems at the University of Wisconsin, Madison had already created that study. Hendrickson’s study followed nineteen organic vegetable farmers for a two-year period and compared financial ratios between small, medium, and large operations to determine the effects of size on profitability. Hendrickson concluded, “There is no ideal size for a fresh market vegetable farm; growers need
to use their management skills and economic analysis tools to figure out the scale and level of mechanization that makes the most sense for them” (Hendrickson, 2005).

After reading Hendrickson’s study, I wanted to take it a step further. I wanted to analyze the factors that were variables in a farmer’s quest for profitability, namely: acres in active production, number of enterprises, and the markets vegetables were being sold into. My goal was to compile the information that would have been so valuable to my parents when they were first starting their operation. I wanted to create a comprehensive resource to help benefit all organic farmers.

Profitability is an underlying concept within the research; however, it became apparent that profitability might mean different things to different farmers. Reimund states at the beginning of his classic review of profitability, “The assumed goal of firms engaged in the production and sale [of crops] is to obtain the largest possible profit given certain operational constraints,” (1987). The rational individual will seek to maximize welfare, and this will come in terms of profitability for their farming practices. This is undoubtedly true, but what I have observed as a member of the organic farm community and through the research obtained in this paper, is that “welfare” can extend beyond monetary terms. Passion for working with the land and creating a better ecological future might compel some organic farmers to continue working on an operation that may not be deemed “profitable” by some.

Although my parents primarily grew herbs for production, this report analyzes organic vegetable farms. Vegetable farming is a good criterion for the research because of the plethora of research surrounding it and ample availability of farmers to interview. It is also diverse enough to encompass many enterprises and distribution methods. The criterion “certified organic” further restricts the data to create a simpler analysis of farm inputs.
Ultimately, I wanted to create a research project that would produce useful results for all organic farmers in planning and maintaining their farms. It takes a lifetime to truly master organic farming; there are so many factors and so much to know. In many ways, farming transcends traditional business practices because so much can come down to a split second decision on the part of the farmer. What I am trying to say is: this research isn’t a comprehensive business plan that is guaranteed success. No document can do that. Planting dates and harvest dates are not “cut and dry;” no spreadsheet can perfectly predict the weather. What this document can do is compile research about profitable farming practices.

This report is designed to do just that. It begins with a literature review of classic economic analysis and farm financial statements, alternative rural enterprises and marketing strategies. It concludes with profitability findings and trends based on the results of the research.
Introduction

Control of agricultural production and sizes of agricultural production have been researched and analyzed for decades. In the 1980s the research was focused on homogenization of farms, control, and market power. Reimud warned in 1987 that 1.2 percent of U.S. farms occupied 10 percent of agricultural land and comprised almost 33 percent of the crop production. His thesis warned that if individual farmers controlled too much, they would have market power and prices would increase drastically. In 2009 size and composition was still a concern with the claim that agricultural productions were consolidating into larger operations and the result was changing production toward fewer farms with more acreage and was restructuring business relationships between farmers, processors, input suppliers, and local communities (Melhim, O’Donoghue, and Shumway, 2009).

Today, the focus of concern has branched and now includes concerns about farm size and the effects of urban encroachment onto farmland (urbanization) and the subsequent amount land available for domestic food supply. Poole warns: “as agriculture evolves and fights to survive in… urbanizing regions, the small farm is going to have to carry more of the burden of agricultural production,” (2004). Although large farms are responsible for the production of the majority of food, small farms comprise 91% of all US farms and occupy more than half of the land. Small farms may produce less than large operations, but can succeed financially through “planning ahead and making good business as well as agricultural decisions” (Poole, 2004).

However, farming is a complex business, and creating the optimal profitable settings is outside many farmers’ control. Increasing acreage, finding money for capital investments, and
finding markets, or simply lack of knowledge around factors that lead to higher net income can stump farmers and lead to little or negative profits.

This literature review is sectioned into three main parts: factors that influence all farms and how they are recorded and analyzed on financial statements, variable factors influenced because of size of operation, and a summary of John Hendrickson’s study: *Grower to grower: Creating a livelihood on a fresh market vegetable farm.*

**Part I – Economic Analysis and Farm Financial Statements**

**Traditional modes of analyzing agriculture: Basic Economic Analysis**

The basic analytical framework for farm analysis views farming in a perfectly competitive market. In economics, agricultural production is noted as being one of the few markets that can be classified as “perfectly competitive.” Producers create nearly identical goods and are considered price takers (Family Farm Project, n.d.). They do not individually determine market price, and farms are allowed to freely enter and exit the market. In general, agricultural goods have high elasticities; other agricultural products can be easily substitutable. In this model, farmers will produce until the marginal costs of production equals the market price; this is also where the supply and demand curves intersect. In the past, the vast majority of research has viewed agriculture within this framework (Hammig & Mittelhammer, 1980).

However, perfect competition analysis is not always an actual representation of the markets; there are many factors that can cause agricultural products to diverge from the model. This can happen when only a few producers control the majority of production and subsequently have substantial market power (Hammig & Mittelhammer, 1980). Another way is through
alternative rural enterprises creating value added products (Sharp, Hewlett & Tranel, “Better Management”).

Economic analysis is important, especially for analyzing markets, but basic analysis only gives an accurate picture of farmer profitability for perfectly competitive markets. In those scenarios, farmer profits are close to zero without government payments. To get a deeper understanding of profitability, farm financial analysis needs to first be understood.

Farm Accounting

There are two main types of accounting for farming: cash based accounting and accrual accounting. Cash based accounting strictly follows cash transactions. It does not include inventory changes. It can record the income over time, but is not actually a true statement of profitability. Conversely, accrual accounting only records the revenues and expenses for each period. So, the cost of fertilizer bought in December for use in May plantings would not add to December’s expenses, the “cost” would be added in terms of increased inventory. Accrual accounting gives a truer value of actual revenues and expenses in each fiscal period. Cash accounting can be important for tax purposes, but accrual accounting gives the best levels of profitability (Teegerstrom, Hewlett, Sharp & Tranel, n.d.).

Valuation of capital assets affects accounting. There are two main ways to value assets, and the subtle difference can change the accounting. The market value approach prices assets from their current estimated market value (such as blue book values). Market value is the best for determining the current solvency of farm assets. Cost value rates assets by summing the cost of the original value and the price of improvements and subtracting depreciation. This value gives the best estimate of net worth and avoids value changes due to market fluctuations.
Financial Statements

Ideally, a farmer would keep three main financial records: income and expense statements, monthly financial records, and annual financial summaries. Income statements are used to calculate the profitability over a specific period of time, which is typically one month or one year. RightRisk.org explains the process of creating a farm income and expense statement to calculate net farm income in three major steps: calculate net cash operating income by subtracting operating expenses from operating revenue, adjusting for changes in capital assets by adjusting for personal consumption and inventory changes (receivables and payables). Net farm income is then calculated by combining the values from the first two steps. To get an accurate net farm income, all farm related financial transactions need to be included into the income statement.

Monthly financial records are simply a summary of information from the income and expense statement (monthly net farm income), and the annual financial summary gives a final value for yearly net farm income (Teegerstrom, Hewlett, Sharp & Tranel, n.d.).

Statements of Owner Equity are another important financial statement. Whereas income and expense statements ultimately calculate farm net worth, statements of owner equity are used to help farmers determine how their personal net worth and stake in the company change between periods. Net farm income and contributions to the business (contributions can come through the owner’s personal finances, gifts, or other means) are added to the beginning net worth; distributions from the business are then subtracted, and value changes in assets are added or subtracted depending on valuation changes. The resulting number from the equation gives the ending net worth (Teegerstrom, Hewlett, Sharp & Tranel, n.d.).
Analyses Used to Determine Financial Health of Farming Operations

Sharp, Hewlett and Tranel identify three main types of analyses to give a comprehensive picture of the health of the farming operation. These include whole farm analysis, investment analysis, and enterprise analysis.

Whole farm analysis simply compares historical data and allows owners and managers to compare farm performance along a time gradient (Teegerstrom, Hewlett, Sharp & Tranel, n.d.).

Investment analysis looks at possible alternative investments and their affects on cash flow. Economic profitability of potential investments is one type of investment analysis. Economic profitability includes a consideration of whether the capital asset will affect long-term cash flow.

Financial feasibility is a second type of investment analysis. Financial feasibility assesses if current cash flows are sufficient to make on time principal and interest payments for potential investments (Teegerstrom, Hewlett, Sharp & Tranel, n.d.).

A third type of investment analysis is economic profitability, which evaluates if the proposed new asset will contribute to profits. Finally, financial feasibility determines if the business can afford to buy new capital assets (Teegerstrom, Hewlett, Sharp & Tranel, n.d.).

Enterprise analysis evaluates specific enterprises within the farm. An enterprise is defined by Sharp, Hewlett and Tranel as “an activity that generates one or more saleable products” (n.d.). Enterprises can include specific crops (corn, wheat, etc) and services (tractor rentals). Analysis of enterprises is extremely important and can help determine which enterprises should be added to production. The specifics of enterprise budgets and their importance for profitability will be explained further at a later point in this report.
Indicators of Financial Health

Financial health of an operation is often determined using financial ratios. Ratios are important because they can provide common relationships for comparison over fiscal periods (Siles, Hogan, & Bryant, n.d.). Financial ratios are the most insightful when compared to industry benchmark standards. Furthermore, following the ratios over several years and analyzing trends gives the most comprehensive understanding of the farm’s financials (Sharp, Hewlett & Tranel, “Better management”).

The following paragraphs in this section explain important ratios for financial health. For the sake of brevity, ratios for liquidity, solvency, and financial efficiency are only listed, whereas ratios specifically examining profitability are explained in further detail.

Liquidity is a measurement of a farm’s ongoing ability to pay financial obligations as they come due without disrupting the normal functioning of the farm (Sharp, Hewlett & Tranel, “Better management”). For example, a farm with strong liquidity is able to meet all loan payments without having to skimp on personnel payments or electricity bills. The three ratios used to calculate liquidity are: current ratio, working capital, and working capital/gross revenues (Sharp, Hewlett & Tranel, “Better management”).

Farm solvency is a measurement of the long-run capability of a farm to meet financial obligations and withstand financial adversity (Sharp, Hewlett & Tranel, “Better management”). Solvency measurements include debt values. It is important to note that debt can improve farm performance. Johnson, Lessley, & Hanson, explicitly state, “while higher debt loads in a farm operation may be risky, debt, in itself is not bad… farmers borrow money because the returns generated from investing in the business generally exceed the interest expense of that debt”
(1998). Important solvency ratios include the debt/asset ratio, equity/asset ratio, and debt/equity ratio.

Financial efficiency is another important measurement. It helps calculate whether or not the farm’s physical resources are being employed and combined in the most profitable manner (Sharp, Hewlett & Tranel, “Better management”). Important ratios for determining financial efficiency include asset turnover ratio, operating expense ratio, interest expense ratio, depreciation expense ratio and net farm income from operations ratio (Sharp, Hewlett & Tranel, “Better management”).

Profitability is the measurement of a farm’s ability to generate more revenue than expenses over time (Sharp, Hewlett & Tranel, “Better management”). Profitability ratios compare the relationship of net farm profit to the labor and management skills necessary for its proper function (Johnson & Lessley, 1998). Profitability is one of two ways to increase a business’s net worth; the other method is by appreciation of asset values (Siles, Hogan, & Bryant, n.d.). The Farm Financial Standards Council recommends five financial ratios for measuring profitability: rate of return on equity; rate of return on investments; operating profit margin; net farm income; and earnings before interest, tax, depreciation and amortization (Sharp, Hewlett & Tranel, “Better management”).

Rate of return on equity compares business earnings to the owner’s investment (Sharp, Hewlett & Tranel, “Better management”; John & Lessley, 1998). It is calculated with the following equation: (net farm income – value of operation labor & management)/average farm assets (Sharp, Hewlett & Tranel, “Better management”).

The equation to calculate the rate of return on assets is: (net farm income + farm interest – value of operation labor & management)/average farm assets. Rate of return on investment is
important because it shows the earnings of the entire farm, which include the debt-financed portions, in comparison to the value of assets used in the production process (Sharp, Hewlett & Tranel, “Better management”; Johnson & Lessley, 1998). For an operation to be profitable, the rate of return on investment needs to have money left over for business growth after interest paid on debt (Poole, 2004).

Operating profit margin calculates how efficient the business is at cost control. It is calculated by dividing operating income by net sales (McBride, n.d.).

Earnings before interest is calculated by subtracting the costs of sales, general administrative costs, and taxes from the sales of the business. This calculation is important because it is “finance-neutral;” it does not include charges from interest (Investor Glossary, n.d.).

Earnings before interest, tax, depreciation and amortization (EBITDA) is calculated by looking at the company’s earnings before taxes, depreciation, and amortization. It is calculated in part with values from the “Earnings before interest” calculation. EBITDA is an especially important calculation for farms because of their heavy levels of fixed assets that have high depreciation charges (think farm machinery) and/or farms with high debt financing. It is used to compare similar companies with the aforesaid characteristics. This measurement is less useful for companies with small or no loans (WebFinance Inc., n.d.).

**Diagnosing Profitability Problems**

There are many avenues to diagnose and solve farm profitability problems if the results of financial ratios show low levels of profitability. Johnson & Lessley created a list of questions for farmers to ask to help distill causes of low profitability (1998). They are copied verbatim below:
1. Are my operating inputs at the optimal level?
2. Is my equipment the proper size for my farm?
3. Do I acquire the most favorable terms on borrowed money?
4. Does my borrowed money earn a rate of return greater than the interest rate I pay?
5. Are my field operations timely?
6. Do I plan and carry out good marketing strategies?
7. Do I make good use of my time and hired labor?
8. Do I take advantage of new technologies?
9. Are there custom fieldwork or off farm employment opportunities that could augment my farm income?
10. Do I maintain good business relations with others?
11. Do I manage my taxes to increase after tax income?
12. Are my family living allowances reasonable?

The University of Arkansas Cooperative Extension also created a flowchart to help farmers diagnose profitability. The diagram is included in Appendix I. In this method of diagnosing profitability problems, the first step is to see if problems are related to low values of farm production. Low values of farm production and a small farm size can lead to small profits. Physical efficiency measures (money back per unit of input), low average selling prices, or poor enterprise combinations could also be factors leading to low values of farm production.

In Siles, Hogan, and Bryant’s evaluation, if profitability is not related to low values of farm production, then analysis of high value of farm production (excessive costs) need to be explored. These include fixed costs (barns, machinery, etc) and economic efficiency measures (ratios of costs per unit of output, diesel fuel expense per acre).

RightRisk.org also provides three suggestions for fixing financial problems. The first is to increase production and exploit all possible efficiencies and production technologies. The second is to restructure costs by targeting specific line items where costs are higher than other farms. The last is to restructure debts, and pursue opportunities to refinance at lower interests and extend terms of loans (Sharp, Hewlett & Tranel, “Understanding financial performance”).
Enterprises

As emphasized earlier, clever combinations of enterprises can improve the efficiency and profitability of a farming operation. Each enterprise is considered a separate “profit center” and has separate risks to consider.

Every farm has limiting components (funding, acreage, manpower, etc.) and therefore enterprises need to be examined separately (for individual profitability measurements) and in relation to other enterprises, because their production can influence other enterprises on the farm. Enterprises can either be: competitive, complementary, or supplementary to one another (Sharp, Hewlett & Tranel, “Understanding financial performance”). Understanding how enterprises relate will give insight into the most profitable combinations.

Part II- Breakdowns Based on Farm Size

Whereas the previous section analyzed basic farm financials that should be standard between operations, this section focuses on variables that change because of farm size.

To start, the USDA defines small farms as operations that have a gross farm income less than $250,000 per year (Poole, 2004). An even smaller class of farms--farming-occupation farms-- are defined as small family farms whose operators report farming as their major occupation and have gross sales less than $100,000 a year (Poole, 2004).

The most recent census of agriculture (2007), showed an increase in the number of small farms in the United States (Weber & Aheam, 2012). As gross farming profits decrease, some operators also need to have an additional job off the farm. There are many challenges and
benefits associated with small-scale farming. One of the benefits is that in many regions, small-scale farms have thrived because of their adaptability to direct-selling markets (Lyson, Stevenson, & Welsh, 2008). Direct-selling eliminates the middle marketer (such as a grocery store or broker) and allows for more of the profits to go to the farmer. Poole identifies challenges with small-scale farming because they are susceptible to the following factors: limited resources (little money for farm improvements and business development), limited purchasing power, limited availability to market because of low volume, limited availability of custom field work because of small field size, limited farm knowledge and experience because the majority of operators are new to farming and do not have an agricultural background, high overhead costs, and a higher average cost per acre (2004).

Although the USDA does not specifically classify the production levels of medium sized farms, research on this is still prevalent. One classification deemed “high-sales farms,” is within the categorization of “small farms” with gross sales between $100,000 and $249,999, could be used to encompass the medium-sized farm. Another criterion for a medium sized farm, not from the USDA, was that these farms had sales greater than $5,000 but less than $250,000 (Jefferson-Moore, Robbins & Smallwood, 2012). Lyson, Stevenson, and Welsh identify that midsize farms have a comparative advantage in producing unique and highly differentiated markets. Because of their size, they have more flexibility to respond to new and unique market preferences but still are able to market to larger entities than individual customers (2008). A study of agricultural in the South Atlantic region of the United States found that small to medium farms (with the sales between $5,000 and $250,000) with USDA organic ‘certification’ labels had high potential to make and establish contracts with wholesalers, and had opportunities to enter multiple sales outlets (Jefferson-Moore, Robbins, & Smallwood, 2012). However, Lyson, Stevenson, and Welsh
also identify that a major problem is a missing “functional value chain” connecting midsize farms to appropriate markets (2008).

The USDA classifies large farms as operations with gross sales greater than $250,000 (Weber & Aheam, 2012). Two sizes exist in the “large farm” criteria. Large family farms are identified as having gross sales between $250,000-$499,999; very large family farms have gross sales greater than $499,999. As identified in the introduction of this literature review, large farms can exercise a great deal of market power if power is exercised in conjunction with multiple operations (Hammig & Mittelhammer, 1980). Scale and scope economies are also important for the production of large-scale farms. Farms are expected to grow in size as long as they are “profit-maximizing, risk-neutral, price-taking” and are exploiting scale and/or scope economies (Melhim, O’Donoghue, & Shumway, 2009). However, financial pitfalls that are prevalent in large-scale farming are higher than average dollar of investment per acre (Reimund, 1987). Research also shows that once farms have reached a certain size, diseconomies of scale may reduce profitability (Melhim, O’Donoghue, & Shumway, 2009).

**Alternative Rural Enterprises**

Depending on the size and market, alternative rural enterprises can create an avenue for increasing profitability and breaking out of the classic economic model of farming as a “price-taking” enterprise. Alternative enterprises can include both alternative crop enterprises and alternative production systems. Both can allow farms to enter “niche markets,” which are typically higher value. Alternative crop enterprises may include specialty crops such as “purple carrots” or “rainbow chard” as opposed to the standard varieties. Alternative production systems include: non-conventional cropping systems, a focus on alternative crops, finding new uses for
traditional crops (such as use in biofuels), value added processing (vegetable washing for ready to eat markets), and crops grown for industrial purposes.

Economically, alternative enterprises can: increase profits by reducing input use by creating more profitable enterprises and improving efficiency; reduce risk through diversification, and by spreading price risk; and better utilize resources through land, labor, or capital changes (Sharp, Hewlett & Tranel, “Understanding financial performance”).

Marketing

Finding the correct market and selling products to the most value-added market is a huge component in farm profits. Alternative markets, as mentioned briefly before, can be important in the profits of a firm. These include: CSA, direct sales, e-commerce, farmers market, u-pick, alliances/cooperatives, and natural/organic. Determining competitive advantage is a key step for determining markets with the most value. Different methods of competitive analysis include looking at: prices, promotion, and distribution (Sharp, Hewlett & Tranel, “Understanding financial performance”).

Summary of “Grower to grower: Creating a livelihood on a fresh market vegetable farm”

John Hendrickson realized that a considerable portion of a farmer’s financial planning comes through informal routes such as neighbor relations and conferences, as opposed to strictly through financial ratios. The purpose behind Hendrickson’s case study was to obtain financial ratios from current organic vegetable farming operations with which other farmers could use to compare to their own operation. John Hendrickson begins his paper with the statement,
“Growing produce is not the biggest hurdle facing most fresh market vegetable growers; earning a reasonable living poses the greatest challenge” (Hendrickson, 2005).

Besides outlining the specific financial ratios and calculated hourly wage for the organic farm operators in the study, he highlights some keys to success. His ten suggestions are summarized below:

1. Manage the soil for optimal productivity.
2. Utilize season extending techniques and technology.
3. Focus on quality; grow premium crops and price accordingly.
5. Use records of production costs to help determine prices.
6. Be smart in investments for equipment; use limited funds to invest in machinery that will increase productivity.
7. Create a marketing plan.
8. Spend time developing an employee management style and training workers.
9. Strive for a net cash to gross ratio of at least 40 to 50 percent.
10. Learn from others.

Hendrickson concludes, “There is no ideal size for a fresh market vegetable farm; growers need to use their management skills and economic analysis tools to figure out the scale and level of mechanization that makes the most sense for them” (Hendrickson, 2005). He found that the farms with the highest gross sales per acre occurred on the smallest farms, but the larger operations generally achieved better salaries for the operators. However, he noted that calculated hourly wages varied widely between operations and production years.

The wages (net cash income/hours worked) for farmers with under three acres in production ranged from $3.32 to $6.57 per hour. Farmers with 3-12 acres in production earned between $2.26 to $16.92 per hour. Individuals farming over 12 acres earned between $3.46 to $14.90. His calculations included net cash income, part of which includes reinvestment costs, which he explains could account for some of the variability.
Methods

The Institutional Review Board at the University of Colorado Boulder approved this study. Two main populations were surveyed for this study. The first was farm operators and owners (referred to as Farmer Population). The second was purchasing/procurement specialists working in the natural foods markets for the companies some of the farms were selling into (referred to as Market Population and Market Businesses). Email addresses for the Farmer Population were obtained using the USDA AMS’s website: http://apps.ams.usda.gov/nop/. Farmers who had certified organic vegetables were sent a recruitment email (See Appendix II for recruitment email text) and link to the survey (See Appendix III for survey questions). The market population information was gathered mainly through internet searches. Email addresses were gathered from websites and recruitment emails (See Appendix IV for recruitment email) were sent with a link to the Qualtrics survey (See Appendix V for survey questions). Businesses recruited were: handler/distributors, cooperatives, grocery stores/grocery store chains, (coordinators), and farm to table restaurants. Because of time and scope constraints, CSA members and farmers market coordinators were not recruited.

The questions were intended to determine how the markets were functioning. Was there a connection between an individual farming operation and the markets it was selling into? Did specific factors of a farming operation influence the markets it could sell into and ultimately its profitability?

Many of the survey questions were intentionally asked as a short answer response. This was a crucial component of the surveys because it allowed the respondents to answer the questions in an unadulterated fashion. Formatting the questions as multiple choice would have biased the results of the survey by providing respondents with prefabricated answers instead of
requiring them to develop their own response. Further, creating a multiple choice survey would have required a comprehensive understanding of the potential answers by the researcher, Brittney Manzagol, and she could have biased results based on only creating multiple choice answers based on her knowledge of organic farming.

Recruitment for both populations occurred in December 2013. The Farm Survey was sent out on December 4, 2013; the Market Survey was sent starting on December 7, 2013. Responses for both were collected until February 6, 2014. 1,478 organic vegetable farmers and 138 “market” businesses were recruited. 107 full responses, a 7.2% response rate, were received from the Farm Population. 32 full responses, a 23.2% response rate, were received from the Market Population.

Like any survey study, this validity of this research is subject to selection bias. Ways selection bias pressures were mitigated in the Farm Survey was to create an anonymous internet survey, which allowed farmers to answer questions in a private setting and without trace back to their operation. Further, by distributing the survey to all farms which fell under the broad search term “vegetables” in the USDA AMS website, allowed for the survey to be sent to a diverse mix of farms regionally, by acreage, and operator age, race, and gender. The evenness of the ratio of profitable to unprofitable farms across each region of the United States suggest that the results of the survey were representative of the farm population across the nation. See Figure II for a graphical representation of results.

Similar to the Farm Survey, selection bias was minimized in the Market Survey through creating an anonymous setting with which participants could answer. Searches for businesses were not region specific; Market businesses were recruited from all across the United States.
Once the data collection was finalized, summary reports were downloaded from Qualtrics. The conglomerate results for each survey question were analyzed as a whole to isolate key terms and concepts. Key terms were chosen based on the number of occurrences between answers from all surveys. This was a crucial step in the conglomeration of the dataset to compare surveys. Once key terms were isolated, a master dataset was constructed. Each survey was individually entered into the master dataset. A 0 was entered as a “No” answer to a question or that a respondent did not include that reasoning in their response, and a 1 was entered as a “Yes” answer to a question; entering the data in this fashion allowed for statistical analysis of the data.

For example, in the Market Survey, Question 14 asked, “What is the most challenging aspect of procuring organic vegetables?” The ten key terms that emerged from the responses related to: (1) availability and seasonality, (2) communication issues with farmers, (3) costs and price structures, (4) transportation logistics, (5) quality issues, (6) quantity issues [to meet specific orders], (7) spoilage issues, (8) supply issues [annual basis], (9) weather issues, (10) other. As individual responses were entered into the master dataset, a one (yes) or a zero (no) was entered to represent if the respondent included the term, or a synonymous term/idea in their survey.

The results section of this report will analyze the specific findings for critical sections of the questionnaire. Results will not be discussed from every section of both surveys. Some survey questions were omitted from analysis because results were seen as irrelevant to the ultimate purpose of this study; the results would not enhance a farmer’s understanding of profitability or ways they could improve their farm’s profitability.
The discussion section will connect findings between the market survey and farm survey and will discuss how key findings could help enhance a farmer’s chance of profitability.

Results

Farm Survey Results

Of the Farm Respondents, 98 indicated what region of the country they were farming. The United States of America was broken into 9 regions: Pacific Northwest (Washington, Oregon and Idaho); Pacific Southwest (California and Nevada); Mountain-Prairie (Montana, Wyoming, North Dakota, South Dakota, Nebraska, Utah, Colorado and Kansas); Southwest (Arizona, New Mexico, Texas and Oklahoma); Midwest (Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Ohio and Michigan); Southeast (Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina, Tennessee and Kentucky); Northeast (Maine, Vermont, New Hampshire, Massachusetts, Vermont, New York, Rhode Island, Connecticut, Pennsylvania, New Jersey, Delaware, Maryland, Virginia); Alaska; and Hawaii. The Northeast region had the most respondents, with 28 surveys completed. There were no respondents from Alaska. Please see Figure I for the number of farm responses from each region. The Southeast region had the highest percentage of profitable farms at 92% and the Pacific Southwest region had the lowest rate of profitable farms at 73%. There was one respondent from Hawaii, who reported a profitable farm. Please see Figure II for a breakdown of profitable and unprofitable farms by region.
For the purposes of this study, farms were categorized into five different size categories. The smallest sized farm respondent was 0.175 acres and the largest farm reported 4,000 acres. Because this study is intended to further John Hendrickson’s findings, the first three categories are based off of his: the smallest size category, the Market Garden, ranges from 0.175 to 2.7 acres; Market Farms range from 2.8 to 12 acres; and Vegetable Farms range from 13 to 80 acres.
There were 12 farms whose acreage was greater than any farms in John Hendrickson’s study. They ranged in size from 80 to 4,000 acres. Because the range was so great, two more categories were created to capture the differences between sizes. Large Vegetable Farms ranged in size from 81-300 acres. 300+ Acre Farms are the largest size category and range from 301 to 4,000 acres. See Figure III for a breakdown of farm size and region. See Figure IV for a breakdown of farm size category and profitability. All farms in the Large Vegetable Farm category were profitable.

![Farm Size and Region](image-url)

**Figure III**
Leased and Owned Acreage Compared to Profitability

Question four on the Farm Survey asked farmers how many acres of land they leased and how many acres of land they owned. A t-test was run that compared the percentage of leased land at profitable and unprofitable farming operations. There were no statistically significant differences between the percentage of land leased and owned between profitable and unprofitable farms.

Number of Enterprises and Non-vegetable Enterprises Compared to Profitability

Question six on the Farm Survey asked farmers, “How many enterprises (crops) do you grow, including double cropping? Example: Tyee spinach and Corviar spinach count as two separate enterprises.” For the purposes of this study, an enterprise was defined as any unique crop variety. Enterprises were defined in this fashion to help capture farms that had higher crop diversity. Please see Figure V for the number of enterprises each farm size category was growing.
as a percentage of each category size. The range of each enterprise category was determined by breaking the data set into quintiles.

![Number of Enterprises Compared to Farm Size](image)

**Figure V**

Market Gardens, Market Farms, and Vegetable Farms, reported growing in all four enterprise categories. Large Vegetable Farms only reported growing in the smallest and largest enterprise categories. 300+ Acre Farms did not report growing more than fifty enterprises.

T-tests comparing the number of enterprises (by the quintile category, thus four total categories) cultivated by profitable and unprofitable farms by size category were run. A single number was assigned to each size category 1 for one to twenty-one enterprises, 2 for twenty-two to fifty, 3 for fifty-one to one hundred, and 4 for one hundred to two thousand five hundred. Statistics were not run for the two largest size categories because there were no unprofitable Large Vegetable Farms to compare, and there was only one unprofitable farm in the 300+ Acre Farm category.

There was no statistically significant difference in the number of enterprises grown between profitable and unprofitable farms in the Market Garden and Vegetable Farm size
categories. However, there was a statistically significant difference between the mean values of
the number of enterprises grown between profitable and unprofitable Market Farms. The p-value
was 0.029. The mean value of enterprises for profitable Market Farms was 2.67, and the mean
value of enterprises for unprofitable Market Farms was 1.67. Thus, for the Market Garden size
category, farms that were growing more enterprises, within the twenty-two to fifty size category,
were more profitable than farms that were growing fewer than twenty-two enterprises.

Question seven of the Farm Survey asked, “What enterprises do you have other than
organic vegetables?” All but fourteen farms had at least one other non-vegetable enterprise. The
greatest number of non-vegetable enterprises was 120 varieties of orchard fruit. Some farms
reported growing hay and grains for production. Because of the large acreage required to
cultivate grain and hay crops, the acres in production numbers were larger when associated with
these farms. These numbers had an effect on the sizes of farms reported in this study. However,
analyzing the fourteen farms only growing organic vegetables would have lead to a study with
much less breadth. The sizes and subsequent profitability of the organic vegetable farms were
contingent upon many factors including crop combinations. Including farms that were growing
both vegetables and hay or grain crops gives a wider range of profitable and unprofitable crop
combinations, and thus all farms with non-vegetable enterprises were included in the study.

**Years Operation Certified Organic Compared to Profitability**

Farmers were asked to report how long their operations had been certified organic. Please
see findings in Figure VI for Profitable Farms and Figure VII for Unprofitable Farms. 0 =
Market Garden, 1 = Market Farm, 2 = Vegetable Farm, 3 = Large Vegetable Farm, 4 = 300+
Acre Farm.
### Table 1

<table>
<thead>
<tr>
<th>Size Category</th>
<th>Average Years Organic - Profitable</th>
<th>Average Years Organic - Unprofitable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Garden “0”</td>
<td>10.08</td>
<td>6.00</td>
</tr>
<tr>
<td>Market Farm “1”</td>
<td>9.27</td>
<td>8.91</td>
</tr>
<tr>
<td>Vegetable Farm “2”</td>
<td>12.63</td>
<td>4.12</td>
</tr>
<tr>
<td>Large Vegetable Farm “3”</td>
<td>17.30</td>
<td>-</td>
</tr>
<tr>
<td>300+ Acre Farm “4”</td>
<td>13.60</td>
<td>17.00</td>
</tr>
</tbody>
</table>
Besides the largest size category, on average, Profitable farms had been operating organically for a longer time than Unprofitable Farms. Please see Table 1 for the average years associated with each size category. There was only one farm in the Unprofitable 300+ Acre Farm size category and it had been farming longer than the average of the Profitable 300+ Acre Farms.

T-tests were run for the three smallest size categories between the years Profitable farms and Unprofitable farms had been operating organically. T-tests for Market Gardens and Market Farms showed the difference between means was not statistically significant. There were no Unprofitable Large Vegetable Farms to compare means with. There was only one Unprofitable 300+ Acre Farm, so statistics were not run. There was a statistically significant difference between the means in the Vegetable Farm size category. The p-value was 0.00051. The mean for Profitable Farms was 12.62 years, and the mean for Unprofitable farms was 4.12 years.

**Years Farmer Farming at Operation Compared to Profitability**

Farmers were asked how long they had been farming at their current operation. Some farmers had been farming at the farm longer than the operation had been certified organic. Figure IX shows years farmed at the operation for profitable farms. Figure X shows years farmed at the operation for unprofitable farms: O = Market Garden, 1 = Market Farm, 2 = Vegetable Farm, 3 = Large Vegetable Farm, 4 = 300+ Acre Farm.
<table>
<thead>
<tr>
<th>Size Category</th>
<th>Average Years Farming at Operation – Profitable</th>
<th>Average Years Farming at Operation - Unprofitable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Garden “0”</td>
<td>18.08</td>
<td>5.25</td>
</tr>
<tr>
<td>Market Farm “1”</td>
<td>12.50</td>
<td>8.30</td>
</tr>
<tr>
<td>Vegetable Farm “2”</td>
<td>18.43</td>
<td>5.38</td>
</tr>
<tr>
<td>Large Vegetable Farm “3”</td>
<td>32.00</td>
<td>-</td>
</tr>
<tr>
<td>300+ Acre Farm “4”</td>
<td>26.4</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 2
For all size categories, on average, operators had been farming more years at Profitable farms than operators at Unprofitable Farms. Please see Table 2 for the average years associated with each size category. There was only one farm in the Unprofitable 300+ Acre Farm size category and it had been farming longer than the average of the Profitable 300+ Acre Farms.

T-tests were run for the three smallest size categories between the years Profitable farms and Unprofitable farms had been operating organically. There was no statistically significant difference between means for Market Farms. There was a statistically significant difference between the number of years between Profitable and Unprofitable farms for Market Gardens and Vegetable Farms. The p-value for Market Gardens was 0.007024; the average number of years respondents had been farming at Profitable farms was 18.08; the average number of years respondents had been farming at Unprofitable farms was 5.25. The p-value for Vegetable Farms was $4.228 \times 10^{-5}$. The average number of years respondents had been farming at Profitable farms was 18.43 and the average number of years respondents had been farming at Unprofitable farms was 5.38.

**Markets Introduction**

Analyzing the markets profitable farms were selling into was a cornerstone of this research project. Farmers were asked to estimate what percentage of their crops were sold into a specific market category: Retail, Direct to Consumer (DTC), and Distributor. Subcategories were created within each category and farmers were further asked to estimate the percentage of their crops sold into each subcategory. An “Other” option was given so all market categories could be accounted for. Leaving a category blank indicated that a farm was not selling directly into that category.
Retail

Retail was the first market category analyzed. Please see Figure XI to see the percentage of farms in each farm category size that reported selling into a Retail Market. Figure XI is reported in a percentage of each category. For this graph, profitable and unprofitable farms in each size category are considered two separate categories.

All five farm category sizes sold into retail outlets. The survey defined four main categories for retail outlets: Natural Food Stores, COOPs, Supermarkets, and Other. Many farms reported restaurants under the “Other” category, and this paper sectioned out those responses into a fifth retail outlet: restaurants. Graphs for unprofitable and profitable farms for each size category are included in Appendix VI. The graphs were calculated based off of average percentages reported by farmers in each profitable and unprofitable category.
Direct to Consumer (DTC)

Direct to Consumer was the second market category analyzed. Please see Figure XI for a general breakdown of what sizes of farms reported selling into a Retail Market. Figure XII is reported in a percentage of each category.

![Percent of Farms Selling DTC Markets](image)

**Figure XI**

The DTC category was broken into five main categories: Farm Stand, You Pick, Community Supported Agriculture (CSA), Farmers Market, and Other. Because a restaurant option was not exclusively stated, some respondents answered “restaurant” in the DTC other portion. These answers were transferred to the restaurant portion of the Retail Markets. Appendix VII has graphs for all categories of farm size and profitability and their percentage of crops sold DTC. All unprofitable farms sold into a DTC market.

Distributors
The third market category was selling to a distributor. Please see Figure XIII for a general breakdown of what sizes of farms reported selling into a Retail Market. Figure XIII is reported in a percentage of each category.

![Graph: Selling to Distributors All Farms]

**Figure XII**

Farmers were asked if they sold to a distributor. The results in the figure above reflect the yes or no distinction. The graphs were calculated based off of average percentages reported by farmers in each profitable and unprofitable category. The majority of profitable market gardens did not sell to a distributor. And all unprofitable farms sold into a distributor.

**Finding Markets to Sell Into**

Farmers were asked how they found markets to sell into in a short answer question. From the answers, eighteen responses stood out. Many farmers indicated that they did not need to
search out markets to sell into and that the market “approached them.” Other responses included resources through non-profits and university agriculture extensions, brokers, cold-calling businesses, community, COOPs and distributors. The “farmers market” responses included both farmers mentioning contacting farmers markets, and finding other markets through a presence at a farmers market. Other responses included in-person visits; internet searches and resources such as internet blue-books; locality (contacting businesses locally); making their own market through founding farmers markets, creating farm stands, or CSA programs, etc. A large percentage of farms indicated that finding markets to sell into was not a difficulty. Other answers included relationships, research, approaching restaurants or restaurants approaching the farmer, word of mouth, and all other responses. Please see Figure XIV for the percentage of farmers in the profitable and unprofitable category that responded to each category.

![All Farms Strategies for Finding Markets](image-url)

Figure XIII
Since the questions were a short answer format, some farms answered that they used many of the eighteen categories outlined above. Some answers fell into a couple categories and were tallied in both categories. For example, a farmer might report, “approached by distributors,” thus the results would tally in both the “distributor” and “Approaches_Farmer” categories.

Perfect Market and Why

Question 16 asked farmers in a short answer question, “In the perfect world, what market would you prefer to sell into and why?” There were twenty-one main results. Ten of those categories were specific markets that a farmer could sell into: “all three” referring to retail, DTC, and a distributor; broker; COOPs; CSA; direct to consumer; direct to market; distributors; farmers markets; wholesale; on-farm markets; restaurants; retail outlets; supermarkets/grocery; wholesale; and you pick. Some farmers indicated specific descriptive words to further describe their ideal market characteristics: contract, diverse, “high-end,” and local all appeared in numerous responses. Please see Figure XV for the percentages of the answers of profitable and unprofitable farms.
Figure XIV

Please see Appendix XIV for a breakdown of ideal market characteristics of profitable and unprofitable farms by size category. Since the questions were a short answer format, some farms answered that they used many of the twenty-one categories outlined above. Some answers fell into a couple categories and were tallied in both categories. For example, a farmer might report, “What I do now,” thus the results would also tally their current market strategy, which would include any of the markets they indicated in the market breakdown questions earlier in the survey.

For the ease of interpreting results, the “why” portion of question was interpreted in a second set of graphs. Thirteen main responses surfaced in the explanation of why markets chosen were ideal: cash sales, community, control, delivery costs, delivery logistics, diversity, fresh, fewer accounts, pre paid, price point, streamlined, volume, and other. The “community” answer encompassed all answers with a social impact theme; for example, some farmers said their perfect market was farmers markets because they could interact with other farmers and
consumers, thus the answer was tallied as a “community” reason. Please see Figure XVI for a breakdown by profitable and unprofitable farms for reasoning for their Ideal Market choices.

Figure XV

Please see Appendix X for a breakdown by farm category size for ideal market characteristics reasoning for each farm size category. Unlike ideal market types, the reasoning was broken down in the general categories instead of subcategories of Profitable and Unprofitable. This was chosen to give a better idea of the specific desires of farms based on size.

Price Determination Process

Question seventeen asked farmers in a short answer question to outline how they determined the price of their produce. Nineteen main responses surfaced: broker, COOP, Cost of Production, Enterprise Budgets, Fair, Margin, Market Comparison, Market Bear, Market Standard, Market Values, MOFGA Sheets, Price Sheets (from non-profits and university extensions), restaurant pricing, retail, retail plus a margin, supply and demand and other. Similar
to previous graphs, some answers counted towards two categories. For example, a response that indicated that a farmer compared prices in a grocery store and added 15 percent would count towards: market comparison, retail, and retail margin. Further, all “enterprise budget” answers were also counted in cost of production. The rationale between creating a subcategory in those two questions was to pinpoint important specific approaches farmers were using in their price determination process.

![Farms Price Determination Process](attachment:image.jpg)

**Figure XVI**

Please see Appendix X for a breakdown by farm category size for the price determination process based on farm size category.

**Market Survey Results**

Thirty-one responses were recorded for the market survey between the categories, handler/distributor, COOP, grocery store, restaurant and other. Some businesses fit into multiple categories, and for the purposes of this study, responses for those businesses were counted in
each category. Thus, a total of forty responses were gathered. Please see Figure XVIII for the number of responses for each market category. The two responses in the other category were a food hub and grocery delivery; because food hubs and grocery deliveries did not fit into one of the main categories, the responses were not counted in the results of the Market Survey.

![Market Count](image)

**Figure XVII**

The market population was asked to report on their annual revenue between ten categories ranging between $0 to $5,000,000. Results fell within six categories. Figure XIX shows exactly how many businesses in each market category fell within each revenue category. Handlers/Distributors reported making the highest annual revenue, 90% of respondents reported earning over $5 million annually, and the other 10% reported earning in the $1 million to $5 million category. The two CSA businesses that made up the CSA category reported the lowest average earnings.
Similar to the farm survey, two questions asked about geographical location. Question four of the market survey asked, “What region(s) of the United States do you procure organic vegetables from?” Question five followed up on this question by asking, “What region(s) of the United States does your company supply to?” Both questions were in a multiple choice and multiple answer format with the same nine regions as the farm survey: Pacific Northwest (Washington, Oregon and Idaho); Pacific Southwest (California and Nevada); Mountain-Prairie (Montana, Wyoming, North Dakota, South Dakota, Nebraska, Utah, Colorado and Kansas); Southwest (Arizona, New Mexico, Texas and Oklahoma); Midwest (Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Ohio and Michigan); Southeast (Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina, Tennessee and Kentucky); Northeast (Maine, Vermont, New Hampshire, Massachusetts, Vermont, New York, Rhode Island, Connecticut, Pennsylvania, New Jersey, Delaware, Maryland, Virginia); Alaska; and Hawaii. No respondents in any market category procured vegetable from Alaska. Only businesses in the Distributor market category reported supplying to Alaska. Please see Appendix
XII for graphs outlining the specific regions for Distributors, COOPs, Grocery, and Restaurants.

In general, Distributors had the widest-reaching procurement and supply regions, and Restaurants had the most narrow procurement and supply regions. When analyzing the data, it is important to remember that the distribution regions are more narrow for COOPs, Grocery, and Restaurants because their physical business address dictates where they are “distributing” produce to, whereas Distributors physically ship produce to their customers, who can include COOPS, Grocery, and Restaurants.

**Produce Procurement Process**

Question seven on the Market Survey asked, “What is the process for produce procurement; are there set requirements a farm must meet to be sold by your company?” This question was a short answer question, which allowed respondents to indicate the set requirements for produce procurement. Undoubtedly, for some of the market businesses, the process is more complicated than was described in the short answer question; however, the neutral question wording was intended to allow the most important aspects of the procurement process to surface.

Nineteen main results arose: contract, as in a required contract with the farm; delivery, the farm needs to deliver produce; distributors, produce comes from distributors; farmers markets, as a place to find farmers and to procure fresh organic vegetables from; “GAP_FoodS_Cert”, which refers to specific certifiable Good Agricultural Practices and Food Safety Certification practices; insurance; local; non-GMO; organic; certified organic, as different than the organic category because the word “certified” was used; organic like, as a unique category where respondents were looking for organic practices but not necessarily a certification;
partnership; pesticide free, as a subcategory under “organic like”; price, anything price-point related; quality; quantity; relationships; sustainable, as a subcategory under “organic like”; and other. Please see Figure XX for the results for the market categories.

![Procurement Requirements Comparison Between Business Types](image)

**Figure XIX**

**Number Of Enterprises and Procurement Decisions**

Question eight in the market survey asked, “Does the number of crops a farm produces play a role in your decision to procure from them?” This question was intended to probe to see if a diverse enterprise portfolio was a compelling reason to procure from a farm, and if so, what market categories found it appealing. Please see Figure XXI for a percentage breakdown. All market categories had more “no” responses than “yes” responses. By percentage, the number of crops made the least difference to distributor; over 80% reported that it was not part of their
procurement process. The number of crops made the most difference to restaurants, with 40% reporting that the number of crops did play a role in their decision.

**Does the number of crops a farm produces play a role in your decision to procure from them?**

![Bar chart showing the percentage of businesses that consider the number of crops when deciding to procure from different types of businesses: Distributor, COOP, Grocery, Restaurant. The chart shows that the number of crops is a significant factor for all business types.]

**Figure XX**

**Ideal Farm Characteristics**

Question nine on the Market Survey asked, “If you could only procure produce from the ‘perfect’ farms for this business, what characteristics would those farms have?” There were twenty main responses: crop availability, related to seasonality; business savviness of farmer; crop delivery; distinct and unique crop varieties; fair labor standards established on farm; family owned and operated; food safety guidelines; insurance; local proximity; organic value systems, that the farmer cares about organic practices; organic practices but not specified as organically certified; organic certification; strict post-harvest handling and processing standards; competitive prices; quality produce; quantity; record keeping and invoicing capabilities; willingness to build relationships; small size; and other answers. Please see Figure XXII for an analysis for each market category.
Business Reasoning for the Sale of Organic Vegetables

Question ten on the Market Survey asked, “Why does your business sell organic produce (specifically organic vegetables)?” The intention for this question was to determine if organic vegetables were being sold for “bottom-line” business decisions, or if there were other factors in play. There were two major themes to the responses: business decisions to support profits and beliefs that supporting organic supported a greater purpose beyond profits. Fifteen main responses surfaced: beliefs, that the sale of organic produce supported a greater philosophical value; business model, that the company was fundamentally developed based on the sale of organic produce; business values, that organic produce supported a company’s business values and philosophy; cultural significance, that purchasing organic vegetables helped support American cultural heritage; demand, organic produce had a significant market demand;
economy, supporting organic farmers contributed to the economy; flavor, organic produce has a better taste; general health, the general category that encompassed all improved health and did not specify environmental or human benefits; environmental health benefits, organic farming is healthier for the environment; human health, consuming organic food is a healthier alternative to conventionally grown produce; non-GMO, the certified organic process ensured that produce was not genetically modified; profit, selling organic produce was more profitable than conventional; quality, organic produce was higher quality than conventional; sustainable, organic growing practices are more sustainable; and other responses. Please see Figure XXIII for a percentage of responses for each market category.

![Reasons Businesses Sell Organic Vegetables](image)

*Figure XXII*
Finding Markets to Sell Into

Question twelve on the Market Survey asked, “How do you connect with the farms whose produce you want to sell?” This question was intended to ask how the market businesses found farms to procure from; however, because of the wording it was also interpreted in a literal fashion for how the market businesses stay in contact with their farms. There were thirteen main responses to this question: distributors, as a way businesses got produce; business events, events created by a business for recruitment; industry events, such as a conference; farm stands; farm visits; farmer approaches business; farmers markets; online directories; phone, email and fax; referrals; relationships, networking; word of mouth; and other. Refer to Figure XXIV to see the answers, by percentage, of businesses in each Market category.
Customer Values

Question thirteen of the market survey asked, “What are the values for your customers in regards to their organic vegetable purchasing?” This question was intended to go one step deeper than the business into organic value systems. This question also aimed to determine perceived value systems of the end consumer. Seventeen main answers ensued: beauty, responses relating to aesthetics of organic produce; community, the community elements created through organics; environment, organics were better for the environment; fresh, organic produce is fresher than conventional; general health, health responses that did not specify human health or environmental health benefits; local, customers value local and organic; organic, the word organic used without being specified as “certified”; certified organic, referring to specific regulatory processes; pesticide free, not using pesticides as a value; price, competitive to conventional price-points; quality; relationships, built around organic; seasonal; taste, organic food as having a greater taste value than conventional produce; and other.

Similar to other questions in this study, some responses could count towards multiple categories, for example

Please see Figure XXV for a graphical representation of answers for each market business type.
Procurement Challenges

Question fourteen of the market survey asked, “What is the most challenging aspect of procuring organic vegetables?” There were ten main responses: seasonality and availability; communication, challenges with farmers relating issues to the market businesses; cost/price, high cost of organic produce; logistics, delivery logistics; quality, challenges with a high quality standard; spoilage, fast spoilage rates; supply, on an annual basis, and challenges with supply in relation to location; weather; and other.

Please see Figure XXVI for the answers from each market category.
Easiest Aspects of Procuring Organic Vegetables

The final question of the Market Survey, question fifteen, asked, “What is the easiest aspect of procuring vegetables?” Seven main answers dominated the results: industry growth, there is significant demand for organic vegetables; locality/logistics, it is easy to get organic produce delivered because of close proximity to farms; quality; quality/taste, a sub-category of quality, which said that organic vegetables taste better; relationships, personal connections as an easy aspect of procurement; suppliers/variety, there are plenty of options when it comes to procuring organic vegetables; and other.
Please see Figure XXVII to see answers from each market population.

**Easiest Aspects of Procuring Organic Vegetables**

![Bar chart showing different categories of procuring organic vegetables with different percentages for each category by type of business.](chart)

**Figure XXVI**

**Discussion**

The purpose of this study was to further John Hendrickson’s findings on farm profitability by isolating specific practices that profitable farms were employing in conjunction with the needs of Market Businesses. The discussion of results will first analyze specific differences in practices between profitable and unprofitable farms based on answers to the Farm Survey, it will then look at the specific needs of the Market Population based on answers to the Market Survey. Finally, it will analyze general areas for farms to focus on to improve profitability as demonstrated based on results from both the Farm Survey and Market Survey.
The Farm Population generally had similar ratios of profitable to unprofitable farms in each region (Figure II). Hawaii was an exception because there was only one respondent. The most Market Gardens, Market Farms, and Vegetable farms were located in the Northeast. The Mountain-Prairie and the Northeast regions were tied for having the greatest number of Large Vegetable Farms. The Mountain-Prairie region had the most 300+ Acre Farms. Besides Hawaii and Alaska, the Southwest had the fewest responses in all categories (Figure III).

There was an extraordinarily large range of number of enterprises (unique crops) being cultivated between the farms. The number of enterprises ranged from 1 to 2,500. The three smallest acreage categories (Market Farm, Market Garden, and Vegetable Farm) had the widest range of enterprises grown between the operations; all three fell within each size category (Figure V). Large Vegetable Farms only reported growing in the lowest (1-21 enterprises) or highest (100-2,500 enterprises) categories. 300+ Acre Farms only reported growing in the two lowest enterprise categories (1-21 and 22-50).

The results suggest that enterprise combinations are the most flexible in organic vegetable farms under 80 acres. 300+ Acre Farms appeared to be the least flexible and were constrained to growing fewer enterprises, this could be due in part to the amount of specialized mechanization required to operate such large acreage. Large Vegetable Farms were split 50% and 50% for the smallest size category and the largest. This could suggest that success in the Large Vegetable Farm category was contingent upon either focusing on a few crops, or a wide array of varieties. However, both the Large Vegetable Farm Category and the 300+ Acre Farm
Category had fewer than 10 farms respond, so results may be specific to the respondents and not necessarily reflect national trends.

Time was a significant component of profitability. Across all size categories, respondents had been farming longer at Profitable farms than Unprofitable farms. This suggests the important role of experience in creating profitability. Farming experience gives invaluable insight into what works and does not work; learning from past mistakes is an important component. Further, the longer an individual is at an operation, the more engrained they can become in the community and network with other regional farmers to share best practices.

There was also an important connection between the number of years the farms had been operating organically and profitability. In general, Profitable farms had been operating organically longer than Unprofitable farms (with the exception of the 300+ Acre farm size category). This could also show the learning curve associated with organic cultivation practices. With time, the operators learn how to leverage organic practices to increase yields and farming efficiencies in addition to furthering their general knowledge of farming as was mentioned in the previous paragraph.

Determining the relationship between profitable farms and the types of markets they were selling into was a cornerstone of this research project. Three main markets were outlined: retail, direct to consumer (DTC) and distributor.

Out of all farm size categories, a higher percentage of profitable than unprofitable farms sold into retail outlets (Figure XI). Appendix VI outlines the average percentage breakdown for farms selling into retail outlets by type of retail outlet. The pie graphs show the percentage of crops being sold into each unique retail outlet out of the total crops sold via retail outlets. For example, in the Profitable Market Garden category, 23% of the crops sold into retail outlets are
sold to a COOP. The most striking finding when comparing the pie graphs is how much more diverse the market mix is for profitable farms than unprofitable farms when selling into retail outlets. Profitable farms were utilizing a more diverse selling portfolio, whereas unprofitable farms tended to rely on fewer categories and sell a higher percentage of crops into those categories.

100% of unprofitable farms reported selling into the Direct to Consumer Category. The Market Farm category had the highest percentage of profitable farms report selling DTC at 88%. Profitable 300+ Acre Farms had the lowest response rate for selling DTC at 50% (Figure XII). Appendix VII shows pie graphs of an average percent of crops sold into each subcategory. The percentage is of crops sold into a DTC category. For example, for Profitable Market Gardens, 35% of the crops sold into the DTC category are sold via a CSA program. Similar to the retail category, profitable farms utilized a wider-array of DTC subcategories to sell crops to; unprofitable farms tended to sell a higher percentage of crops into fewer categories.

The third market category farmers were asked if they sold into was to a distributor. Less than 20% of profitable Market Gardens and Market Farms sold into a distributor (Figure XIII). The size category with the highest percentage of profitable farms selling to a distributor was Large Vegetable farms at 50%. All unprofitable Vegetable Farms sold to a distributor. No Profitable 300+ Acre Farms sold to a distributor.

Question 12 of the Farm Survey asked, “How do you find markets to sell into?” A higher percentage of profitable farms reported community, relationships, locality, and word of mouth. This indicates the importance of personal relationships and networking in terms of marketing strategies and finding potential buyers. No unprofitable farms responded “being involved in the community” or other various answers for “community interactions.” No unprofitable farms
responded to “locality” either. This suggests that profitable farms had higher rates of leveraging “local” status at their markets. Unprofitable farms had a higher response rate for using COOPs, farmers markets, and internet searches, which suggests the potential for impersonal avenues.

The highest response rates for Profitable Market Gardens were “word-of-mouth” and “cold-calls”, whereas unprofitable farms relied more heavily on in-person visits, and relationships. The top two categories for Profitable Market Farms were “word-of-mouth” and that the market approaches the farmer. The biggest response for Unprofitable farms was “farmers markets.” The two highest responses for Profitable Vegetable Farms were “farmers markets” and relationships; Unprofitable Vegetable Farms reported a high rate (25%) each of “Cold-calls,” “Farmers Markets,” “internet” and “relationships.” All Large Vegetable Farms were profitable and the overwhelming answer, at 100%, was “relationships.” The highest responses (50%) for 300+ Acre Farms were “community,” “in-person visits,” and “relationships.” The Unprofitable 300+ Acre Farm reported using word-of-mouth.

Question 16 of the Farm Survey asked, “In the perfect world, what market would you prefer to sell into and why?” This two-part question was separately analyzed by the market type and the reasoning behind it.

Figure XIV outlines the responses from all profitable and unprofitable farms. Answers fell into two categories: specific market types such as restaurants and farmers markets, and descriptors, such as local and diverse. Even though Profitable farms sold a smaller percentage of their crops into retail outlets than unprofitable farms, 22% more Profitable farms indicated farmers markets as an ideal market for selling crops. 17% of Profitable farms reported their ideal market aligned with “What I do now,” as opposed to 6% of unprofitable farms. No Unprofitable farms used the terms “diverse” or “all three market types” to describe their ideal markets,
indicating that a diverse portfolio could be a key to a profitable market strategy. A higher percentage of Unprofitable farms reported a desire to sell into “local” outlets, which could suggest a desire to be more connected with the community, or a desire for price premiums associated with local designation, or a realization of the importance of community to profitable farming.

Appendix XIV contains the graphs of answers from profitable and unprofitable farms. Analyzing the results by market category is a unique way to see what markets farmers perceive to be the best for their business. In the market garden category, over 30% of profitable farms reported Farmers Markets restaurants and retail outlets (general retail category) as an ideal category, and no unprofitable farms reported in either of these categories. Unprofitable farms reported direct to consumer (general DTC category) whereas no profitable farms reported in that category. Over 80% of both profitable and unprofitable Market Farms reported Farmers Market as an ideal market, which is 45% higher than any other size category, suggesting that Farmers Markets are a successful outlet for farms sized 2.8-12 acres. Both profitable and unprofitable farms in this category had a high response rate for restaurants. The highest response rates for Large Vegetable Farms were direct to consumer and on farm markets (33% each). The fewer response categories were chosen for Large Vegetable Farms, suggesting that these farms use a more streamlined approach. 300+ Acre Farms had the highest response rates for “local” (50%), retail (50%), CSA (25%), and Wholesale (25%).

The “why” portion of Question 16 was analyzed by farm size category and was not separated by profitable and unprofitable operations. The intention of this was to get a better idea by category as opposed to differentiating between profitable and unprofitable. A graph of all profitable farm respondents and unprofitable farm respondents was included. The highest
percentage of respondents in the Market Garden category were concerned about “price point” and “streamlined” sales (26% each). “Community” (31%) was the number one concern for Market Farms, followed by “price point” (26%). “Price point” was the overwhelming answer for Vegetable Farms with 41% of respondents indicating that category; “community” was second with 15% of respondents. Similar to Vegetable Farms, the overwhelming answer for Large Vegetable Farms was also “price point” (40%), “diversity,” “streamlined,” and “volume” tied for second place with each having 20% of respondents indicating an answer in each category. 300+ Acre Farms were concerned with “Volume” (75%) and then “Price Point” (25%). “Price Point” was on the forefront of answers for all categories; smaller farms tended to be more concerned with “community” second, larger farms tended to be more concerned with “volume.” This is an important differentiation and distinction between the needs of farms of different sizes of acreage.

All Unprofitable Farms and all Profitable Farms had the same top four answers as justification for their ideal markets. Both Profitable and Unprofitable Farms had 33% of respondents concerned with “price point,” “volume,” “community,” and “streamlined transactions,” although none had more than 23% of farms respond in either the Profitable or Unprofitable Farm Category. Since the question was in a short answer format, some answers and rationale may have seemed “obvious” to farmers and have been overlooked in the reasoning. However, only 33% of respondents indicated price-point as a characteristic of an ideal market. The fact that Community was the third biggest rationale for an ideal market characteristic furthers its importance as an integral part of the farm community and an important factor leading to profitability.

The final question that was analyzed from the farm survey was question sixteen which asked, “How do you determine the price of produce?” Appendix XI includes graphs of the
responses for all Profitable and Unprofitable farms based on size categories. All Unprofitable Farms in the Market Garden category reported using a “market comparison” to determine the price of produce. 60% further defined the market comparison by reporting using “retail prices” to price their own produce. Only 30% of Unprofitable farms reported using price sheets from non-profits and governmental agencies. The two biggest answers for Profitable Market Gardens also were “market comparison” (59%) and “retail” (31%), but at a much lower percentage. 17% of profitable Market Gardens reported using “cost of production” and “MOFGA” sheets to help determine the price of their produce. The highest percentage answer for Market Farms was also “market comparison” with 55% of Profitable Farms and 40% of Unprofitable Farms reporting using the strategy. 40% of Unprofitable Farms reported pricing to what the “market will bear” as opposed to 5% of Profitable Farms. Both Profitable and Unprofitable Farms reported using “cost of production” as a determining factor (25%, and 20% respectively). The difference between Profitable and Unprofitable farms using the “market will bear” strategy suggests that it might not be as effective of a strategy as other methods for Market Farms. “Market comparison” was also the leading strategy for Vegetable Farms; 51% of Profitable farms and 50% of Unprofitable farms reported using the strategy. 33% of Profitable farms reported using “cost of production,” which was not reported by unprofitable farms. All Large Vegetable Farms were profitable, and all also used a “Market Comparison” to determine the price of their produce. 31% reported using “cost of production.” 300+ Acre Farms also heavily relied on “market comparison” (50% Profitable, 100% Unprofitable). The Profitable Farms reported using “cost of production” (25%) and “enterprise budgets” (25%) to help determine price of produce.

Figure XVI compares the percentage of answers between all Profitable and Unprofitable farms, and the trends are very similar. The most major difference is that 25% more Profitable
farms report using “Cost of Production” as a way to determine price. 5% of Profitable farms reported using traditional enterprise budgets. This finding strengthens Hendrickson’s advice to use production costs to help determine price as a way to improve profitability.

**Market Survey**

Results from Handlers/Distributors (referred to as Distributors), Cooperatives (Referred to as COOPs), Grocery, and Farm to Table Restaurants (referred to as Restaurants) will be discussed in this section. Only two CSA respondents and two “Other” category respondents answered, making the categories too small for comparison. The purpose of this discussion section is to highlight findings from each market business type, which farmers could use to improve their relationships with each market type and to ultimately improve profitability through understanding the needs of the specific market business better.

Distributors had the widest procurement and distribution regions because their businesses are designed to distribute produce to many regions. COOPs and Grocery both procured from a wide region, but supplied to a single region, due to constraints of business locations. Restaurants had the narrowest scope of procurement and supply. Restaurants were the most acutely aware of the locality of their food. Appendix XII shows graphs of the percentage breakdown by region where each Market Business was supplying to and procuring organic vegetables from.

Question eight on the Market Survey asked, “Does the number of crops a farm produces play a role in your decision to procure from them?” This question was intended to determine if crop diversity played a role in the procurement decision. Figure XXI shows the percentage of Market Businesses who answered yes or no. In all categories, greater than 60% of Market Businesses answered “No.” Distributors had the highest “no” response rate at 85%; Restaurants
had the lowest “no” response at 66%. Although number of enterprises was not a determining factor for the majority of all market business categories, the results suggest that Restaurants are the most sensitive to crop diversity in produce offerings.

Question seven on the Market survey asked what requirements a farm had to meet to be sold by the specific Market Business. Figure XX outlines the percent responses of Market Businesses by the most popular responses. Organic certification and “organic” were two separate categories to see what Market Businesses were specifically concerned with the official certification, as opposed to a more lenient, and perhaps not official, “organic” practices. However, it should be noted that to some businesses, “organic certification” and “organic” are synonymous and this lack of differentiation would not be captured by the way the data was separated.

The top two concerns for Handlers were organic certification (85%) and then good agricultural practices certification and other food safety certifications (71%). COOPs were almost equally concerned with organic certification (57%) and “organic” (50%); “local” also had a 50% response rate. Grocery Stores were also concerned with organic certification (75%), followed by “organic” (61%), and “relationships” (61%). Restaurants did not have any responses with as high of a percentage as the other three categories. Local, organic certification, and relationships were the top priorities at 43% of respondents.

The results indicate that having a certified organic status is of critical importance for the four Market Categories. The high percentage of results in the Handlers category suggests that those businesses have a more standardized set of priorities, whereas the smaller percentage of responses for each category for Restaurants suggests that there is not a set of standardized requirements between restaurant operations.
Question nine on the market survey asked for the characteristics of a “perfect” farm. This question was asked to further isolate areas where farms can improve their business to meet the needs of the markets they are trying to enter, and to understand what characteristics of a farming operation are the most important to a market business. See Figure XXII. Distributors answered: quality (75%); business savviness (61%), and being able to meet quantity requirements (50%).

COOPs were concerned with: “organic” (66%); organic value systems, that farmers cared about being organic and employing the practices (41%); and local proximity to farming operations (41%). Grocery Stores top priorities ranked: “organic” (50%); and then certified organic, local, and organic value systems (37% each). The four top answers for restaurants were: local, organic values, “organic,” and certified organic all at 42%.

Similar to question seven on the market survey, distributors were the most specific and consistent for what they wanted. Distributors were the only category to mention food safety practices (37%). COOPs and grocery stores had many similar percentage responses, which suggests that there is overlap between the two types of market businesses.

There are some categories within the ideal farm characteristics question that farms can never influence such as availability. For example, some farms will never be able to produce in the winter months. However, business savviness is an area that many farms can clearly improve upon. Market Business respondents indicated that they would like farmers to have a better understanding of the needs of the market business. An area of improvement for farmers is to improve business relationships and transactions, especially in terms of communication. This response often times went along with a desire to have better records and invoicing practices on the parts of the farmers. Focusing on the quality of the crops, especially in regards to post-
harvest processing was an additional opportunity for improvement. Ability to deliver was only mentioned by Grocery and COOPs.

Question ten on the market survey asked, “Why does your business sell organic produce (specifically organic vegetables)?” This question was intended to get down to the root basics of why organic vegetables were seen as an important addition to a produce business. Two main types of answers were recorded. The first category said organic was a cornerstone upon which the business was built and subsequently lead to profits. The second category explored the idea of organics as a value system and a way to propel beliefs about sustainability and environmental stewardship. Please see Figure XXIII for all responses. Distributors were primarily concerned with category number one: that organic vegetables were a critical part of their “business model” (50%). The number one reason for COOPs was general health (health reasons not specified to human health or environmental health) at 73%, followed by the differentiation between environmental health and human health tied at 55% each. Grocery Stores also reported general health as their number one reason for carrying organic produce at 50% of respondents. Restaurants had three top answers: environmental health and human health both had responses at 50%, the word “belief” was also mentioned in 50% of responses indicating the importance of value systems to the choice to include organic vegetables in restaurant food offerings. It is important for farmers to understand the reasons why Market Businesses include organic vegetables in their business portfolio so they can capitalize on the reasoning.

Question twelve asked, “How do you connect with the farms whose produce you want to sell?” This question was included so farmers could understand the methodology the Market Businesses were employing to recruit farmers. However, because of the wording, it was also interpreted in the literal sense of, “how do you communicate with farms?” instead of “how do
you find new farms for your business?” Thus, there were two categories of answers in response to each question interpretation. Please see Figure XXIV to see all responses. Distributors answered in the more literal sense with their number one answer as phone/email communication (61%), the second most common response was farm visits (50%). COOPs also had the highest answer with phone/email communication at 58%; the second most common answer was through a distributor at 41%. Grocery Stores had an equal response for finding farms through farmers markets and phone/email communication (50%). Restaurants had the highest response rate for finding farms at farmers markets (56%) and being approached by the farmer (43%).

Understanding how Market Businesses find and recruit farms can help farms learn how to connect with the Market Businesses. For example, increasing cold-calls to restaurants could lead to new connections. All four Market Business categories had responses related to relationships. Relationships are a reoccurring theme within this research project. Building and improving upon relationships could help lead to new opportunities, especially since 25% of distributors, COOPs and restaurants reported word of mouth as an important method for finding farms.

Question thirteen on the Market Survey asked the Market Businesses why they thought their customers were concerned with organic vegetables. This question was to determine why consumers sought out organics and to see if it was different from the Market Business’ reasoning for supplying organic vegetables. Answers to this question were more varied than the previous questions on the market survey; there was not an overwhelming consensus, yet the reasoning was varied. Please see Figure XXV for a complete graph of the responses. Distributors did not have a top category, answers varied from community to environmental health benefits to increased quality (each answer had 20% of respondents). The top answers for COOPs were general health (50%) and local (50%). The top answer for Grocery Stores was local (50%). Restaurants reported
their customers demanding organic produce because it was healthier for human consumption (50%).

By understanding the final customer’s logic for buying organic vegetables, farmers can tailor their practices and marketing strategies to capitalize on those desires. COOPS and Grocery Stores reported that their consumers were concerned with buying “local,” so farmers interested in maximizing their impact in those categories could approach local COOPs and Grocery Stores.

Questions fourteen and fifteen on the Market Survey asked what the biggest procurement challenges were, and what the easiest aspects of procuring organic vegetables were, respectively. These two questions had the fewest variety of responses compared to the other questions in the Market Survey. Please see Figure XXVI for responses to question fourteen, and Figure XXVII for responses to question fifteen.

The number one challenge for all four Market Business categories was availability and seasonality of crops. Numerous respondents indicated challenges of balancing needs between a desire to procure locally versus supply and seasonality. Cost and price was the second largest category for procurement challenges. By understanding the procurement challenges, farmers can work towards easing those challenges. However, some categories such as seasonality are outside of a farmer’s control. The easiest opportunity for improvement in this category comes in terms of improved communication between Farms and Market Businesses.

All four Market Business categories indicated relationships as an easy aspect of procuring organic vegetables. In fact, this was the number one category for both Distributors (40%) and Grocery Stores (37%). COOPs indicated that having a variety of supply sources was the easiest aspect of procurement (37%). Restaurants answered that the quality of produce and
locality/delivery logistics were the easiest aspects (43%); this suggests that these two factors could be related.

Many themes emerged from the answers to the market survey. However, it is important to remember that this report was based on a small survey sample and answers may not follow industry trends or be statistically significant. Further, a subjective nature was introduced to this study because many of the answers were recorded by respondents in a short answer format and transposed into categories by the researchers. The results of this study are intended to show farmers a snapshot of the practices of other organic vegetable farmers and the needs of the different market businesses they are selling crops into. It is not a comprehensive resource or intended to uncover any hard and fast rules of the industry.

**Conclusion**

One of John Hendrickson’s keys to success was to learn from others (Hendrickson, 2005). The premise of this study was to build upon that idea and ask farmers all across the country factors that contributed to their success. Allowing farms to self-identify as profitable or unprofitable was a streamlined approach to categorization. Separating out answers by profitable and unprofitable farms allowed data to be conglomerated and trends to emerge. Ideally, the differences that emerged between profitable and unprofitable farm practices can be used as part of the dialogue on organic vegetable farm profitability and can help farmers to learn from each other.

A prominent theme that emerged from the results of this study was the importance of community and relationships to both the success of the Farms and Market Businesses. This idea was partly evidenced in response to question sixteen in the Farm Survey “In the perfect world,
what market would you prefer to sell into and why?” when 20% of all Profitable farms answered “community.” Further, 20% of Profitable farms and 14% of Unprofitable farms answered that relationships were a method of finding markets in question twelve in the Farm Survey. This idea was also revealed in the Market Survey when relationships were identified as one of the top three easiest aspects of procurement by all four market business categories.

Although profitability was not defined with strict monetary terms, farms still were able to self-identify as profitable, which allowed the farm respondents to be split into two categories for analysis. Further, allowing farmers to determine their own binary system to define “profitability” allowed for a more holistic measurement. As mentioned in the introduction, profitability for farmers can transcend traditional economic analysis and allowing farmers to self-identify was able to capture what that measurement truly means to farmers. However, farmers using this study as a reference should be aware that the self-identification process also means that a different measurement of profitability was used than John Hendrickson’s study and traditional economic analysis.

Results from this study upheld some of the pieces of advice for achieving profitability reviewed in the literature review of this report. Key findings from Johnson & Lessley’s questionnaire on profitability were supported through this research. Items specifically upheld were their list items nine and ten: “Are there custom fieldwork or off farm employment opportunities that could augment my farm income? [and] Do I maintain good business relations with others?” (2000).

86% of farms reported having enterprises besides organic vegetables, and ten operations (10%) reported non-crop “enterprises” such as owning farm to table restaurants, agronomy
consultation, stained glass business, and agri-tourism. Creativity in leveraging the farm and personal skills is essential to the financial success of many organic vegetable farmers.

Maintaining good business relationships was a critical area for improvement as stressed by all four Market Business categories in answer to questions nine and fourteen in the Market Survey. Question nine asked for characteristics of perfect farms. Business savviness and record and invoicing capabilities were key characteristics. Question fourteen asked about the most challenging aspects of procuring organic vegetables. Communication with farmers was one of ten critical categories to surface.

Two of Hendrickson’s key findings were also supported through the findings of this study. Hendrickson advised, “Focus on quality; grow premium crops and price accordingly” and to “use records of production costs to help determine prices” (2005). “Quality” was an ideal farm characteristic identified by all four Market Business types in question nine on the Market Survey. It was also identified as both a procurement challenge and an easy aspect of procuring vegetables in questions fourteen and fifteen of the Market Survey, indicating that quality is both an expectation, and a difficult marker to achieve.

The importance of records of production and profitability was substantiated through results in the Farm Survey to question seventeen, which asked farmers to outline their price determination process. 25% more profitable farms than unprofitable farms reported using “cost of production” as a tool to determine the price of their produce, and no unprofitable farms reported using “enterprise budgets.” Tracking expenses and creating formal strategies to track costs and create enterprise budgets for crops can be a time-consuming and expensive task for farmers to complete. Smaller farms with fewer resources may find the task even more daunting than larger operations. However, both John Hendrickson’s study and this study indicate that
farms that track expenses and use cost of production as a tool to base pricing have higher rates of profitability.

Although the findings in this research project were not as precise as John Hendrickson’s study because strict profitability measurements were not used, categorizing the farms based on Hendrickson’s size guidelines will allow farmers to compare their profitability measurements to Hendrickson’s, and will also allow farmers to understand how their market strategy fits in with other farmers of similar sizes based on this research project. Ideally farmers can use profitability measurements from John Hendrickson’s study in conjunction with results from this study as a useful resource to gain a deeper understanding of the relationship between farm size and profitability and can use findings from the two studies to help augment existing strategies and propel their farm towards greater profitability.
Appendix

Appendix I- Diagnosing a Profitability Problem

<table>
<thead>
<tr>
<th>Procedure for Diagnosing a Farm Profitability Problem</th>
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<tbody>
<tr>
<td><strong>Value of Farm Production</strong></td>
</tr>
<tr>
<td><strong>Low</strong></td>
</tr>
<tr>
<td>Check farm size.</td>
</tr>
<tr>
<td>If satisfactory, check physical efficiency measures.</td>
</tr>
<tr>
<td>If low, improve with better management practices but watch costs. Profit will not increase if costs increase as much as income.</td>
</tr>
<tr>
<td>If too low, try other marketing strategies.</td>
</tr>
<tr>
<td>If satisfactory for current enterprises, check enterprise combination. Can the fixed resources be used to produce products with a greater value?</td>
</tr>
<tr>
<td><strong>High</strong></td>
</tr>
<tr>
<td>If high and profit is low, the problem is generally related to costs.</td>
</tr>
<tr>
<td>If small, consider increasing farm size or obtaining off-farm employment to increase income.</td>
</tr>
<tr>
<td>If high, look for possible reductions.</td>
</tr>
<tr>
<td>If low, check economic efficiency measures.</td>
</tr>
<tr>
<td>Check fixed costs such as machinery cost, land charges and farm overhead costs.</td>
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University of Arkansas Cooperative Extension Service Document: FSA912
Appendix II- Farmers’ Survey Recruitment Email

Subject: Honors thesis student at the University of Colorado Boulder needs your expert help for her project!

Dear Organic Farmer,

Happy holidays! This year I am grateful for all the delicious organic food grown by America’s farmers.

You are receiving this email because you have identified your farm through the organic certification process as producing vegetables. Your email address was obtained from the USDA ARMs database and online searches.

My name is Brittney Manzagol. I grew up on a small organic farm in Southwestern Colorado and am an honors student at the University of Colorado Boulder. I am looking for organic vegetable farmers to fill out a survey for my honors thesis research project. I am studying the relationship between farm size and its influence on market type.

Participation in this study would require filling out the survey attached to this email. The survey will take approximately 7-15 minutes to complete. Your participation is completely voluntary and anonymous; no data will be linked to yourself or your farm. You will be able to skip questions or not complete the survey as you desire without penalty. To be able to take part in this study, you must be above 18 years of age, and own or operate an organic vegetable farm in the United States.

If you are interested in receiving the results of this study, please email me a request at brittney.manzagol@colorado.edu.

Thank you so much for taking the time to read this email, and I appreciate your help. Please feel free to contact me with any questions or concerns you have.

Kind regards,

Brittney Manzagol

Follow this link to the Survey:
Take the Survey

Or copy and paste the URL below into your internet browser:
https://cuboulder.qualtrics.com/WRQualtricsSurveyEngine/?Q_SS=0pTOWuS5PAHZWMI_e599RNt5GddfHEh&=1

Follow the link to opt out of future emails:
Click here to unsubscribe
Appendix III- Farmers’ Survey Questions

Title Interplay of Factors Influencing Organic Vegetable Farm Size and Entrance into Natural Foods Markets

You are being asked to participate in a survey research project entitled “Interplay of Factors Influencing Organic Vegetable Farm Size and Entrance into Natural Foods Markets,” which is being conducted by Brittney Manzagol, an honors student at the University of Colorado Boulder. This survey is anonymous. No one, including the researcher, will be able to associate your responses with your identity or farm. Your participation is voluntary. **You may choose not to take the survey, to stop responding at any time, or to skip any questions that you do not want to answer.** You must be at least 18 years of age to participate in this study. Your completion of the survey serves as your voluntary agreement to participate in this research project and your certification that you are 18 years of age or older.

Questions regarding the purpose or procedures of the research should be directed to Brittney Manzagol at 970-316-1658 or brittney.manzagol@colorado.edu. The IRB, a university committee established by Federal law, is responsible for protecting the rights and welfare of research participants. If you have concerns or questions about your rights as a research participant, you may contact the IRB at 303-492-7401.

Please email Brittney (brittney.manzagol@colorado.edu) for a copy of the final research report and report summary if you would like a copy. The report will be completed in April 2014. You are encouraged to print out and keep this statement for your records.

**This survey should take less than 7-10 minutes to complete; it is comprised of 20 multiple choice and short answer questions.**

---

**Q1 What region of the United States do you farm?**

- Pacific Northwest (Washington, Oregon, Idaho)
- Pacific Southwest (California, Nevada)
- Mountain-Prairie (Montana, Wyoming, North Dakota, South Dakota, Nebraska, Utah, Colorado, Kansas)
- Southwest (Arizona, New Mexico, Texas, Oklahoma)
- Midwest (Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Ohio, Michigan)
- Southeast (Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina, Tennessee, Kentucky)
- Alaska
- Hawaii
Q2 How far do you live from an urban area? Population >60,000 people [Short Answer]

Q3 How many acres of land do you operate? (Excluding fallow) [Short Answer]

Q4 How many acres do you lease and/or own? [Short Answer]
   _____ Number of Acres Leased
   _____ Number of Acres Owned

Q5 Is your operation profitable? [Multiple Choice – Single Answer]
   ○ Yes
   ○ No

Q6 How many enterprises (crops) do you grow, including double cropping? Example: Tyee spinach and Corviar spinach count as 2 separate enterprises. [Short Answer]

Q7 What enterprises do you have other than organic vegetables? [Short Answer]

Q8 Do you sell your crops into retail outlets? If so what types and give a rough percentage of your crops sold this way. (Leave bars at zero if none) [Multiple Choice – Slider]
   _____ Natural Food Stores
   _____ Cooperatives
   _____ Supermarkets
   _____ Other Retail Outlet

Q9 Do you sell your crops direct to consumer? If so what types and give a rough percentage of your crops sold this way. (If no, leave bars at zero) [Multiple Choice – Slider]
   _____ Farm Stand
   _____ You Pick
   _____ CSA
   _____ Farmers Market
   _____ Direct to Consumer Other

Q10 Do you sell your crops through a distributor? If yes, please give a rough percentage of your crops sold this way. (If no, leave bar at zero) [Multiple Choice – Slider]
   _____ Yes

Q11 If you answered "yes" to the last question, how many distributors do you use? [Short Answer]

Q12 How do you find markets to sell into? [Short Answer]

Q13 How many years has this operation been certified organic? [Short Answer]

Q14 How many years have you been farming at this operation? [Short Answer]

Q15 In the perfect world how many acres would you want to grow and operate? [Short Answer]
Q16 In the perfect world, what market would you prefer to sell into and why? [Short Answer]

Q17 How do you determine the price of produce? [Short Answer]

Q18 Where do you get your greatest satisfaction in farming? [Short Answer]

Q19 What causes your greatest anxiety in farming? [Short Answer]

Q20 What do you see yourself doing in 10 years? [Short Answer] [Page Break]

Thank you for taking the time to complete the survey. Your participation is an invaluable contribution to the research.

Please email Brittney Manzagol at brittney.manzagol@colorado.edu if you would like a copy of the final report and report summary in April 2014.
Appendix IV- Market Survey Recruitment Email

Subject: Honors student at the University of Colorado would like to include [Business Name] in research project

To Whom it May Concern at [insert business name]:
---Or---
Dear __________: [Identified appropriate person in company to answer questions from research]

I am a student at The University of Colorado Boulder, and I am conducting research for my Honors Thesis Project, titled “Interplay of Factors Influencing Organic Vegetable Farm Size and Entrance into Natural Foods Markets”. I am studying the relationship between the acreage of a farm and the type of markets they can sell into and if size and/or value systems are important factors in determining entrance availability.

Your company, ___[insert business name]___ fits within the parameters of my research, and if you have time and it is in accordance with your company’s policy, I would love to conduct a quick interview (less than 15 minutes) about your procurement –or—farm recruitment process for organic vegetables.

During this study, you will be asked to answer some questions as to how your company chooses organic vegetable farms/produce for sale.

Questions will be basic and not seeking proprietary information. Nonetheless, because of the University of Colorado’s strict research standards, all the information will be kept confidential and will be reported in an anonymous manner in my final report unless you give permission otherwise. If you choose to participate you will be able to skip any questions and end the interview at any point.

If you are interested in participating in the study, please follow this link to the anonymous survey: https://cuboulder.qualtrics.com/SE/?SID=SV_5uM8tLHo3JEPIQZ. Or, I would be happy to conduct a phone interview at your convenience.

If you are interested in the results of the study, reply to this email and I would be happy to send you the final report in April 2014.

Have a great day and thank you for taking the time to read this email.

Sincerely yours,

Brittney Manzagol
Appendix V- Market Survey Questions

Title: Market Version - Interplay of Factors Influencing Organic Vegetable Farm Size and Entrance into Natural Foods Markets

You are being asked to participate in a survey research project entitled "Interplay of Factors Influencing Organic Vegetable Farm Size and Entrance into Natural Foods Markets," which is being conducted by Brittney Manzagol, an honors student at the University of Colorado Boulder. This survey is anonymous. No one, including the researcher, will be able to associate your responses with your identity or business. Your participation is voluntary. **You may choose not to take the survey, to stop responding at any time, or to skip any questions that you do not want to answer.**

You must be at least 18 years of age to participate in this study. Your completion of the survey serves as your voluntary agreement to participate in this research project, your certification that you are 18 years of age or older, and that participation in this survey is compliant with company policy.

Questions regarding the purpose or procedures of the research should be directed to Brittney Manzagol at 970-316-1658 or brittney.manzagol@colorado.edu. The IRB, a university committee established by Federal Law, is responsible for protecting the rights and welfare of research participants. If you have concerns or questions about your rights as a research participant, you may contact the IRB at 303-492-7401.

Please email Brittney (brittney.manzagol@colorado.edu) for a copy of the final research report and report summary if you would like a copy. The report will be completed in April 2014. You are encouraged to print out and keep this statement for your records.

**This survey should take 5-15 minutes to complete; it is comprised of 15 multiple choice and short answer questions.**

Q1 What type of business is your company? [Multiple Choice – Multiple Answer]
- Handler/Distributor
- Cooperative
- Grocery Store-Single Store
- Supermarket - Regional Chain
- Supermarket - National Chain
- Farmers Market
- Consumer Supported Agriculture (CSA)
- You Pick
- Farm Stand
- Restaurant
- Other ____________________
Q2 Is this company financially profitable? [Multiple Choice – Single Answer]
- Yes
- No

Q3 Approximately what is your company's annual revenue? [Multiple Choice – Single Answer]
- <$1,000
- $1,000-$5,000
- $5,000-$10,000
- $10,000-$20,000
- $20,000-$50,000
- $50,000-$100,000
- $100,000-$500,000
- $500,000-$1,000,000
- $1,000,000-$5,000,000
- >$5,000,000

Q4 What region(s) of the United States do you procure organic vegetables from? [Multiple Choice – Multiple Answer]
- Pacific Northwest (Washington, Oregon, Idaho)
- Pacific Southwest (California, Nevada)
- Mountain-Prairie (Montana, Wyoming, North Dakota, South Dakota, Utah, Colorado, Kansas)
- Southwest (Arizona, New Mexico, Texas, Oklahoma)
- Midwest (Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Ohio, Michigan)
- Southeast (Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina, Tennessee, Kentucky)
- Northeast (Maine, Vermont, New Hampshire, Massachusetts, Vermont, New York, Rhode Island, Connecticut, Pennsylvania, New Jersey, Delaware, Maryland, Virginia)
- Alaska
- Hawaii

Q5 What region(s) of the United States does your company supply to? [Multiple Choice – Multiple Answer]
- Pacific Northwest (Washington, Oregon, Idaho)
- Pacific Southwest (California, Nevada)
- Mountain-Prairie (Montana, Wyoming, North Dakota, South Dakota, Utah, Colorado, Kansas)
- Southwest (Arizona, New Mexico, Texas, Oklahoma)
- Midwest (Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Ohio, Michigan)
- Southeast (Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina, Tennessee, Kentucky)
- Northeast (Maine, Vermont, New Hampshire, Massachusetts, Vermont, New York, Rhode Island, Connecticut, Pennsylvania, New Jersey, Delaware, Maryland, Virginia)
- Alaska
- Hawaii
Q6 How close is your business or your business's chain to an urban area (population greater than 60,000)? [Short Answer]

Q7 What is the process for produce procurement; are there set requirements a farm must meet to be sold by your company? [Short Answer]

Q8 Does the number of crops a farm produces play a role in your decision to procure from them? [Multiple Choice – Single Answer]
   ☑ Yes
   ☐ No

Q9 If you could only procure produce from the “perfect” farms for this business, what characteristics would those farms have? [Short Answer]

Q10 Why does your business sell organic produce (specifically organic vegetables)? [Short Answer]

Q11 Approximately how many farms does it take to meet your company’s requirements for organic vegetables? [Short Answer]

Q12 How do you connect with the farms whose produce you want to sell? [Short Answer]

Q13 What are the values for your customers in regards to their organic vegetable purchasing? [Short Answer]

Q14 What is the most challenging aspect of procuring organic vegetables? [Short Answer]

Q15 What is the easiest aspect of procuring organic vegetables? [Short Answer] [Page Break]

Thank you for taking the time to complete the survey. Your participation is an invaluable contribution to the research.

Please email Brittney Manzagol at brittney/manzagol/colorado.edu if you would like a copy of the final report and report summary in April 2014.
Appendix VI – Retail Percentage Breakdown

**Profitable Market Gardens Average Retail Breakdown**

- Retail_NatFood: 42%
- Retail_COOP: 18%
- Retail_Super: 15%
- Retail_Restaurant: 23%
- Retail_Other: 2%

**Unprofitable Market Gardens Average Retail Breakdown**

- Retail_NatFood: 92%
- Retail_COOP: 8%
- Retail_Super: 0%
- Retail_Restaurant: 0%
- Retail_Other: 0%
Profitable Market Farm Average Retail Breakdown

- Retail_NatFood: 0%
- Retail_COOP: 28%
- Retail_Super: 34%
- Retail_Restaurant: 1%
- Retail_Other: 37%

Unprofitable Market Farm Average Retail Breakdown

- Retail_NatFood: 0%
- Retail_COOP: 69%
- Retail_Super: 31%
- Retail_Restaurant: 0%
- Retail_Other: 0%
Profitable Large Vegetable Farms Average Retail Breakdown

Profitable 300+ Acre Farms Average Retail Breakdown
Unprofitable 300+ Acre Farms
Retail Breakdown

- Retail_NatFood: 11%
- Retail_COOP: 0%
- Retail_Super: 89%
- Retail_Restaurant
- Retail_Other

Pie chart showing the retail breakdown of unprofitable 300+ acre farms.
Appendix VII – Direct To Consumer Percentage Breakdown

**Profitable Market Gardens Average DTC Breakdown**

- Direct_FarmStand: 35%
- Direct_YouPick: 4%
- Direct_CSA: 7%
- Direct_FM: 1%
- Direct_Other: 53%

**Unprofitable Market Gardens Average DTC Breakdown**

- Direct_FarmStand: 56%
- Direct_YouPick: 34%
- Direct_CSA: 56%
- Direct_FM: 41%
- Direct_Other: 7%
**Profitable Market Farms DTC Breakdown**

- Direct_FarmStand: 59%
- Direct_YouPick: 6%
- Direct_CSA: 23%
- Direct_FM: 9%
- Direct_Other: 3%

**Unprofitable Market Farms Average DTC Breakdown**

- Direct_FarmStand: 95%
- Direct_YouPick: 0%
- Direct_CSA: 0%
- Direct_FM: 1%
- Direct_Other: 1%
- 4% (other categories)
Profitable Large Vegetable Farms DTC Breakdown

Unprofitable Vegetable Farms DTC Breakdown
Appendix VIII – Strategies for Finding Markets

Market Gardens' Strategies for Finding Markets

Market Farms' Strategies for Finding Markets
300+ Acre Farms' Strategies for Finding Markets

- Approaches: Farmer, Extension, NP
- Cold Calls
- Community
- COOP
- Distributor
- Farmers' Market
- In Person Visits
- Internet
- Local
- Make Own Market
- No Struggle
- Relationships
- Research
- Restaurants
- Word of Mouth
- Other

Profitable
Unprofitable
Appendix XIV – Ideal Market Characteristics By Size of Farm

Market Gardens Ideal Market Characteristics

Market Farms Ideal Market Characteristics
Vegetable Farms Ideal Market Characteristics

Profitable Large Vegetable Farms
Ideal Markets (No Unprofitable)
300+ Acre Farms Ideal Market Characteristics

% Of Farms Per Category

- Unprofitable
- Profitable
Appendix X – Ideal Market Characteristics Reasoning

Market Gardens Ideal Market Characteristics

Market Farms Ideal Market Characteristics
ALL Unprofitable Farms Ideal Market Characteristics
Appendix XI – Farms Price Determination Process By on Size Category

**Market Gardens Price Determination Process**

![Graph showing the price determination process for market gardens, with categories like Broker, COOP, Cost of Production, Enterprise, Fair, Margin, Market Comparison, Market Standard, Market Values, MOFGA, Price Sheets, Non-Profit, Resistance, Buying, Restaurant, Retail, Retail Margin, Supply, Demand, and Other. The graph compares profitable and unprofitable farms.]

**Market Farms Price Determination Process**

![Graph showing the price determination process for market farms, with similar categories as the market gardens graph. The graph also compares profitable and unprofitable farms.]

Vegetable Farms Price Determination Process

Profitable Large Vegetable farms Price Determination Process (No Unprofitable in this Size Category)
Appendix XII – Market Categories Procurement and Distribution Regions

**Distributors' Procurement and Distribution Regions**

% of Distributors

- Procure From
- Supply To

**COOPs' Procurement and Distribution Regions**

% of COOPs

- Procure From
- Supply To
Works Cited


Dillivan, K. D. Colorado State University, Colorado State University Extension. (2012). Understanding economic depreciation for farms and ranches (Fact Sheet 3.766)

Dillivan, K. D. Colorado State University, Colorado State University Extension. (2012). Where does the money go? Food marketing margins explained (Fact Sheet 3.765)


Fleming, R., & Breece, D. Ohio State University, The Ohio State University Extension. (n.d.). Flexible cash rents for farmland (FR-0002-01)


Gutierrez, P. H., & Dalsted, N. L. Colorado State University, Colorado State University Extension. (2012). Break-even method of investment analysis (Fact Sheet 3.759)


Johnson, D., Lessley, B., & Hanson, J. University of Maryland College Park-Eastern Shore,
Maryland Cooperative Extension. (1998). *Assessing and improving your farm solvency* (Fact Sheet 540)


Lessley, B., Johnson, D., & Hanson, J. University of Maryland College Park-Eastern Shore, Maryland Cooperative Extension. (2000). *Enterprise budgets in farm management* (Fact Sheet 545)


Poole, T. University of Maryland College Park-Eastern Shore, Maryland Cooperative Extension. (2004). *Operating a profitable small farm* (Fact Sheet 1)


USDA, NATIONAL AGRICULTURAL STATISTICS SERVICE. (2011). *2011 Washington annual agriculture bulletin*


Wu, S. Ohio State University, The Ohio State University Extension. (2003). *The economics of contracts for non-economists* (AE-10-03)