

**From Grain to Glass: Assessing Opportunities for Craft Brewers to Use
Locally Grown Agricultural Ingredients
FY 2011**

Craft brewing across America is becoming popular. The Brewers Association reports that there are more than 2,500 breweries operating in the United States, with more than 1,500 other breweries in the planning stage. The Massachusetts craft brewery industry has seen rapid growth over the past decade also. As of December 2013, there were 71 establishments in operation throughout the state.

Interest in sourcing ingredients locally has grown in recent years. Environmentally and socially conscious craft brewers find that using local ingredients can lower the environmental impact while supporting a stronger socio-economic fabric in the state. Brewers are also noticing the marketing potential of using local ingredients to capitalize on the interest of consumers and farm-to-table style restaurants in the 'buy local' cause. Massachusetts growers produce a wide variety of specialty ingredients, and as brewers experiment and differentiate their product, they can explore diverse ingredients such as cranberries, oysters, pumpkins, honey, herbs and spruce tips.

This study provided an 'economic snapshot' of the Massachusetts craft beer industry to determine the varieties of ingredients being used, as well as the volume and value of ingredients being sourced locally vs. non-locally. This economic snapshot provides information to growers, brewers, and agencies regarding demand for brewing ingredients, average ingredient prices and overall opportunities for sourcing more local ingredients. The information fills a gap in knowledge to describe this opportunity. Best practices for brewers and growers who aspire to take advantage of this market are identified.

FINAL REPORT

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Grain to Glass Final Report

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Introduction

Craft brewing across America has grown at an astonishing rate. The Brewers Association reports that there are currently more than 2,500 breweries operating in the United States, with more than 1,500 other breweries in planning. Over the first six months of 2013, craft beer dollar sales were up 15%, with similar growth for the previous three years. Paul Gatza, director of the Brewers Association says 'Demand for beer produced by small and independent brewers has never been higher, as evidenced by increased production and the hundreds of new breweries joining the playing field each year... beer drinkers nationwide are responding positively to high-quality, full-flavored, diverse offerings from American craft brewing companies that continue to innovate and push the envelope'[1].

Similarly, the Massachusetts craft brewery industry has seen rapid growth over the past decade. Adding more than a dozen breweries in the past year, there are 71 establishments operating as of December 2013. The value of ingredients being used by local breweries represents a sizeable portion of agricultural products imported from other states. While Massachusetts has always had the capacity to provide brewing ingredients, the interest in sourcing ingredients locally has grown in recent years. Craft brewers who are environmentally and socially conscious realize the many benefits to using local ingredients, as local food systems typically have lower environmental impacts and support a stronger socio-economic fabric in the state. Brewers are also noticing the marketing potential of using local ingredients. As awareness in sustainability continues to rise throughout the populace, many consumers and farm-to-table style restaurants are supporting the 'buy local' cause

through purchasing beers made using locally grown ingredients. Massachusetts has a wide variety of specialty ingredients available for brewers, and as brewers seek to experiment and differentiate their product, they are more likely to explore ingredients, such as cranberries, oysters, pumpkins, honey, herbs and spruce tips. Sourcing local ingredients also appeals to brewers who are seeking sustainable initiatives for both ecological and marketing purposes. Due to the small size of the businesses, using local ingredients helps to display regional pride and therefore reach out to the surrounding customer base.

In 2010, the Vermont Agency of Agriculture Food and Markets alongside the MDAR commissioned a hops feasibility study (found [here](#)), which researched the viability of commercial hop production in New England. The report found that there is enough demand from the local brewing community to support a minimum of 100 acres of production, equivalent to 150,000 lb. or \$1,500,000 of dried hops. This is significant enough to support several small scale (1-10 acre) hop farms [2]

The report also investigated the nature of the local craft brewing industry; it found that the local industry is built on product differentiation, innovation, quality and community. These qualities translate into brewers' desire for freshness and quality, support of local economies, and interest in uniqueness of beer style, all of which lend well to supporting local ingredients. The report also found that the size and scale of Massachusetts craft breweries positions them well for working with small to medium-sized local farms. While this study focused on hop production, these insights can confidently be applied to specialty ingredients as well.

Massachusetts' prices for farmland is among the highest in the United States; in 2013, the average value per acre in Massachusetts was \$10,600, compared to \$2,900 for the national average [3]. This, alongside the fact that Massachusetts farms are much smaller than the national average, means that growers must have diversified production and customers for economic viability. The average size for a farm in Mass is 68 acres, while the average size for farms in the Midwest and Northwestern US are 537 acres and 1,225 acres respectively [4]. Identifying a new market opportunity and providing best practices for brewers and growers to work together can support the development of this marketing sector.

The strong growth in the craft brewing industry, the expanded interest in using local ingredients and the findings from the hops study are all key factors that lead to the conclusion that demand for local ingredients will grow through the next several years. In order to make the most of this opportunity, an 'economic snapshot' of the Massachusetts craft beer industry was developed to determine the varieties of

ingredients being used, as well as the volume and value of ingredients being sourced locally vs. non-locally. This economic snapshot would provide information to growers, brewers, and agencies regarding demand for brewing ingredients, average ingredient prices and overall opportunities for sourcing more local ingredients. The information provided fills a gap in knowledge to describe this opportunity.

Using locally grown ingredients can have varying implications for the brewing process. One of the most pervasive examples is the use of local hops. While most commercial brewing processes use pelletized hops, local hops are preserved in the whole flower form, which is either fresh or dried. Therefore, the processes by which local and non-local hops are used in the brewing process widely differ. Likewise, using locally grown and malted grains poses problems in quality and consistency. Using specialty ingredients also require special attention in the brewing process. These series of challenges, both in traditional and specialty brewing ingredients, may act as a limiting factor in brewers using local ingredients. By examining specific cases of brewers who have successfully implemented procedures for overcoming these challenges, the MDAR can disseminate this information.

[1] <http://www.brewersassociation.org/pages/media/press-releases/show?title=brewers-association-reports-continued-growth-for-u-s-craft-brewers>

[2] <http://www.uvm.edu/extension/cropsoil/wp-content/uploads/hops-feasibility-study.pdf>

[3] http://www.nass.usda.gov/Publications/Todays_Reports/reports/land0813.pdf

[4] <http://usda01.library.cornell.edu/usda/current/FarmLandIn/FarmLandIn-02-19-2013.pdf>

Description of how issue/problem was approached via the project

Survey

Referencing the objectives laid out in the proposal, the work plan follows:

- 1) *A survey was developed by MDAR with input from the staff agricultural economist Bill Gillmeister whose background includes survey design. MDAR distributed the survey to all the craft brewers in Massachusetts and worked to achieve a 100% return rate. Close to a 50% response rate was achieved. The*

information will be analyzed and summarized by MDAR and results shared with the Massachusetts Brewers Guild. The types of specialty ingredients required, amounts and estimated value will be included, and a database established.

To gather data to quantify variety, volume, and value of local ingredients for craft brewers, MDAR developed a survey with a review from the MBG via the advisory board. After the one-month development period of the initial draft, the survey was tested and reviewed by Will Meyers from Cambridge Brewing Company as well as Rob Martin and Mary Gormley from Mercury Brewing Company. A second and final version of the survey was created alongside an electronic version using Qualtrics online survey software. After the survey was distributed, follow-up to brewers who had yet to take the survey was performed for several months.

MDAR used the Massachusetts Alcohol Beverage Control Commission's list of licensed breweries in the state and collaborated with the Massachusetts Brewers Guild to ensure all breweries in the state would be included as survey recipients. A cover letter was included explaining the project to the recipients. The initial distribution, consisting of 60 surveys, saw a small return rate, but with the development of the online version of the survey and the rigorous follow-up via e-mail and telephone, a total of 52% of all potential respondents. While this figure fell short of expectations, SuperSaver released a white paper reporting the average survey response rate being 32.52%, which shows the return rate for the MDAR survey was a success [1].

Amongst the survey respondents, there were those who took the survey immediately, those who took it 2+ months after distribution, and those who did not take the survey at all. Brewers who took the survey immediately were most enthusiastic about the project; many were heavily involved in sourcing local ingredients and had values strongly aligned with the 'buy local' message. Potential reasons for non-respondents and those who took much longer to submit surveys include lack of time, complexity of providing ingredient information and low interest in sourcing local ingredients.

The recipients of the five-page survey (either the owner and/or headbrewer of the establishment) provided information about the brewery and the ingredients used. More specifically, the survey targeted information about brewery name, address, contact information, beer styles brewed, tour/tasting room information, sales, and workforce demographics. In order to collect data about ingredient usage, a chart was provided (figure 1.) that, once filled out, would give a clear picture of what ingredients are being used, whether they were being sourced locally or not, and at what price points and

volumes they were being sourced at. Information and data from the survey were pulled from paper and online surveys and compiled into a series of spreadsheet in preparation for analysis.

Figure 1:

4. Please list the ingredients used in your beer in 2011 and the approximate volume and value:

	Currently Used?	Locally sourced – from whom: what farm (or your own brewery)?	Total Quantity Sourced	Local Quantity Sourced	Total cost	Cost of ingredients sourced locally	Ideally, when would the product be available?
	Check if yes	Check if yes and contact	(lbs./bushels)	(lbs./bushels)	(\$)	(\$)	(Date/Month)
Hops							
Grains							
Barley							
Rye							
Wheat							
Other							
Apples							
Blueberries							
Cranberries							
Grapes							
Herbs							
Chocolate							
Honey							
Maple Sugar							
Oysters							
Peaches							
Pears							
Pumpkins							
Raspberries							
Spruce Tips							
Strawberries							
Others, please list							

Analysis

Account for Unresponsive Brewers

After collecting the survey responses and organizing them into spreadsheets, significant data cleanup was conducted to organize the information in more manageable formats. The next step was to account for all the brewers who did not respond to the survey, in order to create a comprehensive ‘snapshot’ of the entire Massachusetts craft beer economy. This was done using a ‘multiplier’; a calculated figure that, when applied to the reported ingredient usage, would come to represent 100% of Massachusetts breweries. To give a basic example of how this might work, if half of all breweries responded, the multiplier would be 2. Since 50% of breweries responded, multiplying each reported ingredient by 2 would account for the unresponsive brewers. However,

when carrying out the analysis, the calculation of the actual ‘multiplier’ and resulting ingredient totals was much more complicated.

Instead of grouping all the breweries together (as the previous example did), the breweries were put into one of four categories, arranged by size, and each category was given a separate multiplier. Using information provided by the Massachusetts Department of Revenue, the list of breweries by size was created, along with their respective size categories. Putting a large microbrewery in a different category than a small microbrewery would make the results more accurate, as the two breweries have different purchasing habits.

Brewery Size	Number of Barrels Brewed per Year
Small microbrewery	0-300
Medium Microbrewery	301-1,000
Medium-Large Microbrewery	1,000-2,500
Large Microbrewery	2,500-15,000
Regional Craft Brewery	15,000+

Within each category, the multiplier effect was calculated by dividing the number of total barrels by the number of barrels that the respondents represent. Calculating using barrelage ensures that the size difference between breweries within each category was being properly accounted for. After totaling the ingredients in each category, the corresponding multiplier effect was applied to arrive at ingredient totals that represent the entire category, including the non-respondents. Each category’s totals were aggregated to arrive at ingredient totals that represented the entire Massachusetts craft brewing economy.

Example of brewery multiplier: (multiplier = total number of barrels divided by number of respondents’ barrels)

Brewery	# of Barrels Brewed Per Year	Brewery size	Multiplier
Brewery #1 (non-respondant)	850	Medium microbrewery	2.03306063
Brewery #2 (non-respondant)	331	Medium microbrewery	
Brewery #3 (non-respondant)	512	Medium microbrewery	
Brewery #4 (non-respondant)	750	Medium microbrewery	
Brewery #5 (non-respondant)	500	Medium microbrewery	
Brewery #6 (non-respondant)	580	Medium microbrewery	
Brewery #7 (respondant)	667	Medium microbrewery	
Brewery #8 (respondant)	719	Medium microbrewery	
Brewery #9 (respondant)	660	Medium microbrewery	
Brewery #10 (respondant)	300	Medium microbrewery	
Brewery #11 (respondant)	423	Medium microbrewery	
Brewery #12 (respondant)	642	Medium microbrewery	

Example of multiplier effect in action:

Brewery	Hops total quantity (lb.)	Hops total cost	quantity (lb.)	Hops local cost	Barley total quantity (lb.)	Barley total cost	Barley local quantity (lb.)	Barley local cost
Brewery #7 (respondant)	1,800	\$11,000			100,000	\$74,000		
Brewery #8 (respondant)	2,000	\$16,000			110,000	\$82,000		
Brewery #9 (respondant)	750	\$6,000	50	\$750	30,000	\$30,000	3,000	\$3,000
Brewery #10 (respondant)	1,000	\$10,000	160	\$2,400	10,000	\$8,000	800	\$1,100
Brewery #11 (respondant)	525	\$5,100			54,500	\$2,900		
Brewery #12 (respondant)	350	\$3,200			24,800	\$34,100		
<i>Initial totals</i>	6,425	\$51,300	210	\$3,150	329,300	\$231,000	3,800	\$4,100
*MULTIPLIER	2.0331	2.0331	2.0331	2.0331	2.0331	2.0331	2.0331	2.0331
TOTALS	13,062	\$104,296	427	\$6,404	669,487	\$469,637	7,726	\$8,336

An attached spreadsheet (Appendix 1) details what varieties of ingredients are being used, their total volume and value being sourced, their local volume and value being sourced, their non-local value and volume being sourced, as well as average prices for each category. This portrays a clear economic snapshot of what ingredients are currently being sourced in Massachusetts and what opportunities exist for particular ingredients to be sourced more in-state.

MDAR has developed a grower list for brewers, which includes a list of all farms currently supplying MA brewers and the ingredients available for each, found in Appendix 2.

Additionally, two brewer spreadsheets were created. The first list details all the brewers currently operating in MA, with their addresses and phone numbers (Appendix 3). The second details all brewers who are currently using local ingredients, along with which ingredients in particular they are using (Appendix 4).

2. MDAR is now promoting the summary to growers to solicit additional suppliers by sharing information at local growers meetings and in the Farm and Market Report. MDAR facilitated outreach to potential suppliers through state commodity groups such as the New England Vegetable and Berry Growers Association and MDAR publications including email blasts and the Farm & Market report.

MDAR promoted this project at the MA Farm Bureau Meeting on December 5, 2013; the New England Vegetable and Berry Growers Association meeting on December 17 – 19, 2013; NEVBGA meeting on February 1, 2014; the MA Wholesale Training February 25, Westminter and is being including in newsletters for several associations. MDAR has also developed a webpage for both growers and brewers: http://www.mass.gov/agr/massgrown/culinary_tourism/brewery_tours.htm

3) One grower/brewer educational session will be facilitated.

A grower brewer meeting is scheduled for March 11, to share the results of the survey and engage growers and brewers in connecting for local ingredients. It will be held at MA Bay Brewing Company in Boston, who use apples for their hard cider.

4) At least two case studies regarding brewers and growers will be generated and posted on the MDAR website to generate awareness from other growers and brewers.

A total of three case studies were conducted over the course of the project. The goal was to find brewers who were exceptional at sourcing local ingredients and to determine their key success factors. After conducting background research on the brewery and the brewer, MDAR intern Phil Marquis conducted in-depth interviews with brewers for 1-2 hours in length, discussing their brewing operation, supply chain, challenges faced, success stories, and overall recommendations for the Massachusetts Department of Agricultural Resources. The three cases studies are on the MDAR website on the grower resources page at:

<http://www.mass.gov/eea/agencies/agr/markets/culinary-tourism/hops-brewer-resources.html>

The first participant was headbrewer Ben Roesch from Wormtown Brewing Company in Worcester. Wormtown is well-known throughout the brewing community as a brewery committed to using local ingredients. The brewery's motto 'A Piece of Mass in Every Glass' reflects the brewery's initiative to put at least one Massachusetts ingredient in every batch. Brewing more than 2,000 barrels per year, Ben Roesch has found some excellent methods for overcoming the challenges in sourcing local ingredients.

The second participant was headbrewer Will Meyers from Cambridge Brewing Company, one of the oldest brewpubs in the country. In April of 2013, Will celebrated his 20th year brewing with CBC, making him one of the most seasoned brewers in the state. The brewpub's mission 'Sustainability and creativity in all we do' pervades every aspect of brewing; developing recipes, sourcing ingredients, utilizing special tools, and more.

The third participant for a case study was owner/brewer John Goodfellow from Goodfellow's Brewing. In 2011, he teamed up with Paul Hunt from Frugal Endeavors

farm to create an authentic and unique brewer-grower partnership. The brewery itself sits upon a plot of the farm, and all ingredients grown by the farm, including hops, blackberries, and pumpkins get put into the beer. This creates an excellent microcosm of a 'closed loop' of money and ingredients that could one day come to represent the Massachusetts craft brewing economy.

Each case study provided unique and useful insights, which are detailed in later sections.

5) Information relevant to the project will be posted on the MDAR website as well as made available to the MBG.

A new webpage was developed on the MDAR website http://www.mass.gov/agr/massgrown/culinary_tourism/brewery_tours.htm

6) A follow up evaluation survey will be coordinated, project summarized, and results shared with the agriculture industry through commodity group and MDARs newsletter and website, as well as shared the MBG.

Due to the slow response rate from brewers getting the survey complete and analyzing the results, it was not possible to conduct an evaluation during the timeframe of this project.

[1] http://www.supersurvey.com/papers/supersurvey_white_paper_response_rates.pdf

Description of contribution of public or private agency partners in terms of the work performed

MDAR staff member, Lisa Damon, Program Coordinator, worked as the liaison to FSMIP for this project. MDAR staff member, Bonita Oehlke was the Marketing Specialist, MDAR Project Coordinator, and liaison to MBG. MDAR staff member Catherine DeRonde, analysis based on her economics background. MDAR intern Phil Marquis provided project assistance including collection of survey response, tabulation, case studies, evaluation and the draft development of final report and web pages. Simmons Dietetic Intern Annette Jochum assisted in the final report write-up. Sarah Ryan, MDAR staff assisted with case study edits prior to posting on the MDAR website.

MDAR worked with the Massachusetts Brewers Guild (MBG) as an advisory group member. MBG is a 501(c)(6) non-profit corporation, organized for the purposes of promoting craft brewing and protecting the interests of craft brewers in Massachusetts. Membership is open to

all Massachusetts breweries licensed by the Federal Tax and Trade Bureau and the Commonwealth's Alcoholic Beverages Control Commission. The MBG aided in the promotion of the survey to its members.

Advisory board members included Andrea Stanley, barley grower and micromaltster Valley Malt, Hadley, Jason L-Etoile, Hops grower Four Star Farm, Northfield, Mary Gormley, sales and event coordinator, Mercury Brewing, Ipswich, Mike Paone, promotions specialist, Harpoon Brewery, Boston, Will Meyers, headbrewer from Cambridge Brewing Company, Cambridge, Ben Roesch, headbrewer from Wormtown Brewing, Worcester, Bryan Greenhagen, fermenter, Mystic Brewery, Chelsea, Chris Lohring, headbrewer, Notch Brewing, Steve Prouty, grower, Clover Hill Farms, and Bonita Oehlke, MDAR.

The Commonwealth's Alcoholic Beverages Control Commission provided a list of licensed MA craft brewers for survey target audience. The MA Department of Revenue provided baseline data for 12 months of beer distribution and the value.

Kurt Staudter, executive The Vermont Beer Trail, was consulted for advice on the creation of a state beer trail to connect consumers to breweries that specialize in local products.

Will Meyers of Cambridge Brewing Company, Ben Roesch of Wormtown Brewery, and John Goodfellow of Goodfellow's brewing dedicated time and information for the completion of three case studies.

Results and Insights

Survey Results

A paper and electronic version of the survey were distributed to all licensed breweries in the state of Massachusetts. At the close of the survey response, August, 2013, there had been a total of 37 returned surveys, representing 52% of the Massachusetts brewing community. Additional follow-up was conducted to gather local ingredient figures; while they did not fill out and return a complete survey, their ingredient usage was included in the analysis.

Local ingredients sourced by volume and value

Top Local Ingredients by Value	
Ingredient	Local value
Apples	\$231,830
Barley	\$75,200
Maple syrup	\$37,341
Wheat	\$21,614
Hops	\$16,908
Bluberries	\$14,146
Pumpkins	\$10,574
Herbs	\$8,686
Oysters	\$6,050
Raspberries	\$6,045
Cranberries	\$5,720
Honey	\$4,545
Spruce tips	\$3,803
Rye	\$2,882
Strawberries	\$1,464
Other grains	\$635

Top Local Ingredients by Volume		
Ingredient	Unit	Local volume
Apples	lb.	123,252
Barley	lb	25,319
Pumpkins	lb.	15,760
Wheat	lb.	14,924
Herbs	lb.	2,441
Raspberries	lb.	2,415
Bluberries	lb.	2,298
Other grains	lb.	2,188
Cranberries	lb.	2,172
Rye	lb.	2,098
Honey	lb.	1,164
Maple syrup	gal	1,152
Hops	lb.	1,092
Oysters	lb.	976
Strawberries	lb.	976
Spruce tips	lb.	222

Total volume/value of local ingredients (and gap between the two)

In 2012, some 28,106,712 lbs of brewing ingredients were sourced by Massachusetts brewers, totaling \$25,316,438. Of this, 198,448 lbs worth \$447,000 represented locally-purchased ingredients. When comparing local and total sourced ingredients, we find that .7% (by volume) and 1.77% (by dollar amount) of ingredients are sourced locally.

All ingredients		
	Total	Local ingredients
Volume	28,106,712 lbs.	198,448 lbs.
Value	\$25,316,438	\$447,443

When comparing local and total sourced hops and malted grains, we find that .16% (by volume) and .47% (by dollar amount) of hops/malted grains are sourced

locally. During phone follow-up for collecting survey responses, many brewers stated that they would like to source more of these ingredients locally.

Hops/malted grains		
	Total	Local ingredients
Volume	27,929,477 lbs.	45,620 lbs.
Value	\$24,948,687	\$117,239

When comparing local and total sourced specialty ingredients, (no hops or malted grain) we find that 86.2% (by volume) and 89.8% (by dollar amount) of specialty ingredients are sourced locally. Compared to traditional brewing ingredients (hops and grains), there are much higher opportunities to source specialty ingredients locally. While MA will probably never be able to supply all the hops and grains needed for beers, specialty ingredients are used in much smaller quantities. About 10% (by volume) and 14% (by value) of specialty ingredients are sourced non-locally, indicating that Massachusetts is quite close to sourcing all of these ingredients in-state. As the 'buy local' message spreads throughout the brewing and farming community, Massachusetts can increase its capacity to supply 100% of local ingredients.

Specialty ingredients		
	Total	Local ingredients
Volume	177,234 lbs.	152,827 lbs.
Value	\$367,751	\$330,203

Top Local Ingredients

Top 5 Local Ingredients			
By Size		By Value	
Apples	123,252 lbs.	Apples	231,830
Pumpkins	15,760 lbs.	Maple sugar	\$37,341
Herbs	2,441 lbs.	Blubberies	\$14,146
Raspberries	2,415 lbs.	Pumpkins	\$10,574
Cranberries	2,298 lbs.	Herbs	\$8,686

The top local ingredients were sorted by size (weight) and by value (dollar amount). One Regional Craft Brewery (producing 15,000+ barrels per year) produces a series

of ciders brewed with all Massachusetts apples, which leads to the fruit topping the 'local ingredients' list in both volume and dollar-value sourced.

By volume, pumpkins are the next most locally sourced ingredient. A wide variety of pumpkin beers are brewed in Massachusetts, leading Cambridge Brewing Company to host an annual 'Great Pumpkin Festival' which features a total of 51 different pumpkin beer varieties. Even with its popularity, the extra labor needed to prepare pumpkins for brewing acts as a limiting factor in using fresh pumpkins. The average price for MA pumpkins are only .67 cents per pound, which is why it falls at #4 for 'top local ingredients – by value' list.

Maple syrup is the second most valuable local agricultural product being sourced. At \$32.40 per gallon of locally sourced maple syrup, it is the most expensive brewing ingredient to purchase, being more than twice as costly as any other locally sourced brewing ingredient. MA breweries source just over 1,100 gallons of it per year; the relatively high average price per gallon brings the yearly value of locally sourced maple syrup to \$37,341.

Herbs and berries were also quite popular as locally sourced brewing ingredients. Many of the herbs used were grown by the brewer themselves, often on the site of the brewery/brewpub. Since there are many varieties of herbs available in the state, the price point used to calculate the total value was an 'average' of several popular varieties. Many varieties of berries are grown throughout the state; raspberries, cranberries, blueberries, strawberries and blackberries together accounted for 7,936 lbs. of agricultural products worth \$27,496. Furthermore, 100% of all berries used in Massachusetts beers were grown in-state.

Top Opportunities for produce to be more locally-sourced			
By Size		By Value	
Pumpkins	21092 lbs.	Pumpkins	\$15,673
Honey	1440 lbs.	Maple sugar	\$11,754
Chocolate	787 lbs.	Honey	\$5,667
Herbs	362 lbs.	Chocolate	\$2,280
Grapes	302 lbs.	Peaches	\$830

The preceding chart shows the ingredients with the most opportunity for more to be sourced in-state, by both volume and value. This is calculated by subtracting the 'locally sourced' number from the 'total' number. The resulting figure is the total

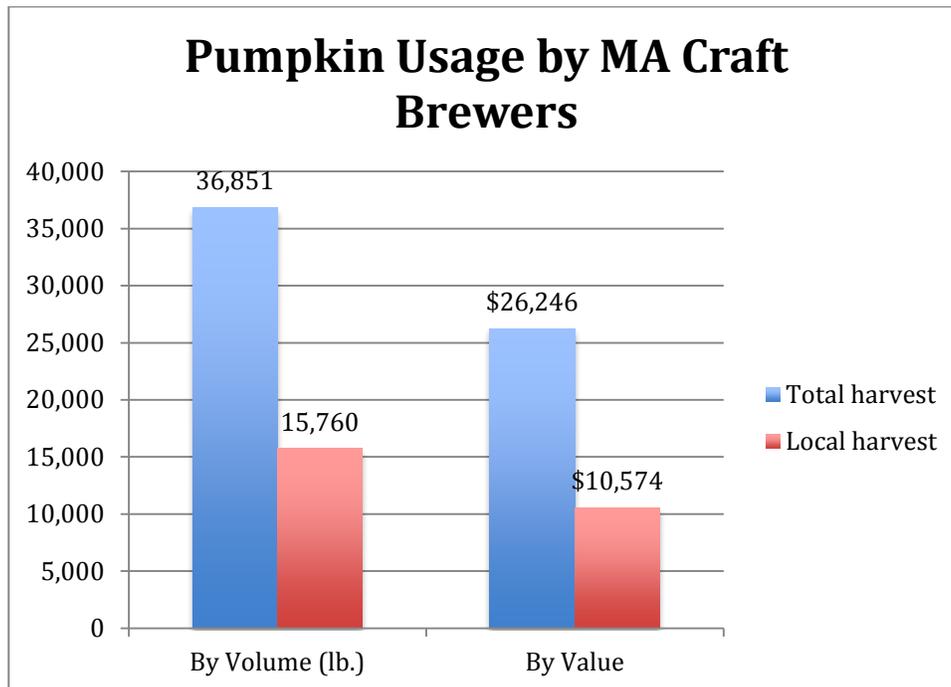
amount sourced non-locally, which acts as an accurate depiction of the volume and value of the ingredient that can *potentially* be sourced in-state.

Overall, pumpkins have the biggest opportunity in both volume and value for more to be sourced in-state. While fresh pumpkins are popular throughout Massachusetts, many farmers reported difficulty in availability, harvest time and sourcing the right variety, which caused them to source pumpkins from other New England states.

Maple syrup and honey are both valuable commodities that, while not sourced in large numbers, have much potential in terms of dollar value they could bring to the Massachusetts economy.

Sourcing Pumpkins 100% Locally

As seen in the previous chart, pumpkins have the highest opportunity for more produce to be sourced in-state, in both volume and value. In total, there is currently 36,851 lb. of pumpkins being sourced by MA brewers, worth \$26,242. Of this, 42%, or 15,760 lbs. worth \$10,574, is sourced in the state of Massachusetts. The USDA National Agricultural Statistical Service claims that each acre of pumpkin field produces an average of 25,900 lb. of pumpkins [1]. Therefore, Massachusetts growers would need to harvest 1.42 acres worth of pumpkins to supply MA craft brewers with 100% of their pumpkin needs.



Purchasing Habits of Different Sized Breweries

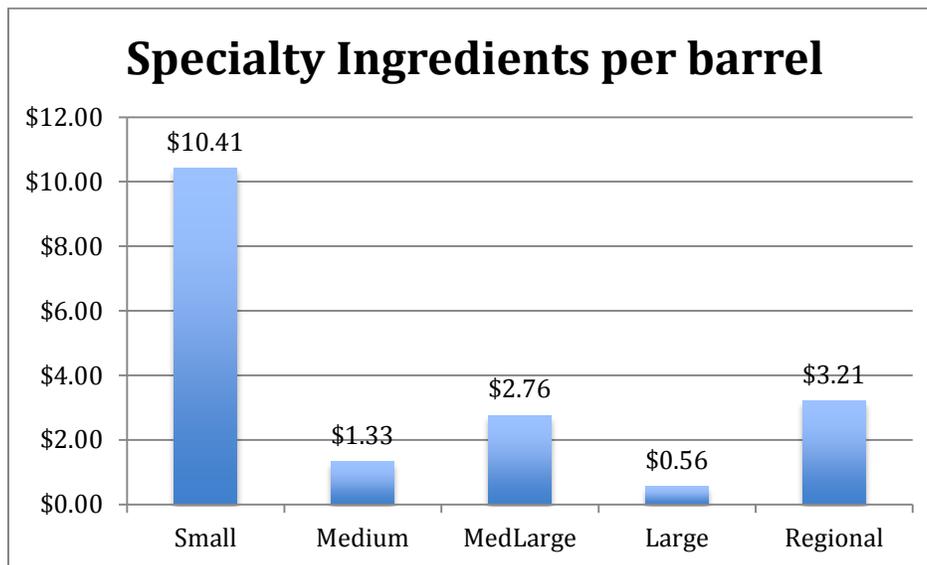
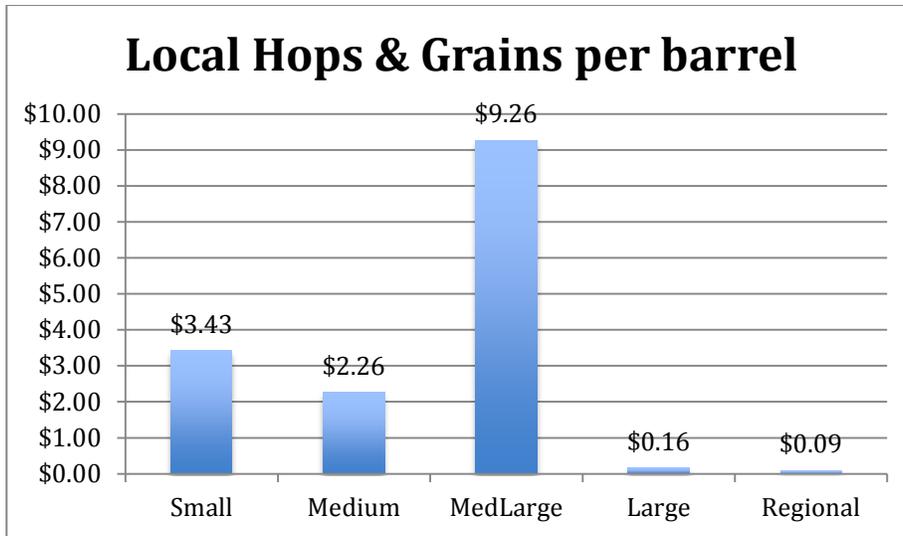
In the original analysis of the survey results, breweries were divided into size categories; small microbrewery, medium microbrewery, medium-large microbrewery, large brewery, and regional craft brewery. Additional analysis was conducted to see how breweries in these difference size categories differed in the amount of ingredients that were sourced locally and non-locally, which is represented in a chart in Appendix 5.

The smaller the brewery, the more local ingredients were sourced

There is a general trend that the larger breweries source less local ingredients on a per-barrel basis. This is because larger breweries face significant challenges in being able to source local ingredients in large volumes. Larger breweries need to work with suppliers that operate on similar levels of economies of scale; because local farms are smaller in size than their Midwestern counterparts, their volumes and subsequent price points may not be adequate enough for larger breweries to utilize them.

The scale of operation that smaller breweries operate on make it much easier to work with local farms. These smaller breweries are much more likely to find growers that are able to offer volumes and price points that work for their brewing operation. The smaller the brewing operation, the easier it is to find enough volume of a particular ingredient locally and the easier it is to keep costs under control. Smaller breweries are also more likely to be flexible in their brewing operation, which is crucial when extra steps are needed when using local ingredients. While both small and large breweries must adjust their processes, small breweries have the advantage of adjusting their processes for smaller batches of beer, while larger breweries must make considerably larger and more time-consuming adjustments to their much larger batches.

As seen in the following chart, small, medium and medium-large breweries sourced much more local hops and grains on a per-barrel basis than large and regional craft breweries. In the next chart, small microbreweries use much more specialty ingredients per barrel than the rest of the size categories combined.



Prices, availability and processes

While local ingredients have an important marketing benefits, i.e. branding the beer as ‘creative’ or adding a fruity element, syrups and flavorings are much less expensive, easier to use in the brewing process, are easily stored, and readily accessible.

Using local ingredients costs more money. When asked about the difference in costs between using local ingredients and non-local ingredients, Ben Roesch from Wormtown Brewery said that local barley and hops costs twice as much, and local wheat costs three times as much. For his ‘Masswhole’ variety of beer, which uses all

Massachusetts-grown ingredients, using all local ingredients versus non-local translates into a \$20 increase in cost per keg. Farmland prices in the state are the 4th highest in the country; in 2013, the average value per acre in Massachusetts was \$10,600 [2]. The increase in land values directly impact operating costs for growers. Massachusetts' farmers also grow on smaller farms than their Mid- and North-western counterparts; the average size for a farm in Mass is 68 acres, while the average size for farms in the Midwest and Northwestern US is 537 acres and 1,225 acres respectively [3]. Since MA farmers' economies of scale are smaller, they in some cases have higher price points as part of their sustainable business plan. They also tend to focus on direct marketing rather than wholesale marketing, and have a diversified portfolio of crops and customers.

Using local ingredients necessitates extra processes in the brewing process. For example, when using fresh pumpkins (as opposed to pumpkin flavorings), brewers are responsible for peeling, de-stemming, scooping and chopping dozens of pumpkins before using them in the brew kettle. Likewise, using fresh, whole leaf hops is much different than using the typical pelletized hops, which most brewers are assimilated to using. Brewers must be creative and use special techniques and tools to extract maximum bitterness and flavor from the fresh hops. For example, Will Meyers from Cambridge Brewing Company uses three different methods. He uses a special hammer mill to pulverize dried hops, which can then be used in the kettle. He also uses a stainless steel cage, which is filled with hops and dipped into the kettle, acting as a large tea ball for the wort. A more complex method includes using a hop back: a device that is used between a hot boiler and a fermenter. Once filled with hops, it acts as a 'hop filter' as the wort passing through is infused with hop bitterness and aromas.

Using local ingredients also necessitates planning when ordering ingredients. Sourcing traditional brewing ingredients involves operating within a supply chain that has already been developed for the national food system. This means that brewers can source non-local ingredients as easily as many restaurants order their food supplies. A large supplier can be found online, an order is placed through internet or phone, and a truck delivers the pallet of brewing ingredients within a number of days. Brewers who source local ingredients do not have many of these conveniences. One of the main challenges brewers face is finding a farm that has adequate supply to be able to sell their produce at wholesale quantities and prices. Many Massachusetts farms sell directly to consumers, which makes finding the right farmer even more difficult. While non-local ingredients and flavorings can be available year-round, local produce is very seasonal and available only at a certain time of the year. This is especially important for seasonal beers; brewers who use

syrops and flavorings have the advantage of being first to market, while brewers who are dedicated to using local ingredients must heed to Mother Nature's timing. For example, Will Meyers from Cambridge Brewing Company insists on his pumpkin beers being seasonally appropriate. While his beers made with local pumpkins are kegged in mid-September, beers made with pumpkin flavorings are able to make it to market by early to mid-summer in preparation for the early demand of the fall-style beers. With seasonality and availability being a concern, brewers who were most successful at sourcing local ingredients maintained contact with the farmer several months before harvesting to check on timing and 'reserve' a portion of the crop ahead of time.

Despite the numerous challenges faced when sourcing local ingredients, there remains a committed group of Massachusetts breweries who are doing all they can to source ingredients from the local food system. Their dedication to the local economy shows through their willingness to pay more for local ingredients, put extra work into the brewing process, and plan ahead.

Furthermore, while this may not be a huge opportunity, it is important for the right grower to add new channels of revenue to their existing base. Local farms could add customers through the consideration of increasing the production of some crops such as pumpkins, or deciding to sell their produce wholesale. Likewise, the local craft beer economy depends on growers who continue to support the infrastructure for hops and specialty malted grains in Massachusetts as well as overall connections with brewers.

Best Practices for Brewers

Use the tools provided in this report

For brewers who are finding difficulty sourcing local ingredients, this report contains a few essential tools that brewers can use to further their local sourcing initiatives. The most crucial of these tools is the list of local farmers that are currently supplying Massachusetts farms, found in Appendix 2. The list of growers and ingredients is an excellent reference for brewers who are having difficulty with availability/finding a source. Another tool that brewers can use is the list of brewers using local ingredients, found in Appendix 4. This list can be used as a reference for brewers who are looking to network within their line of expertise and can assist with finding a grower, processing challenges, and other difficulties unique to brewers using local ingredients. Brewers can also use the ingredient spreadsheet, found in Appendix 1, to find which local ingredients are being used most frequently

as well as their respective price points. This fills a crucial gap in information that can settle any uncertainties brewers have about using particular local ingredients.

Keep in contact with growers

Brewers who are most successful at sourcing local ingredients plan well in advanced. They check in early and often with growers, in order to be knowledgeable of harvest dates, as well as to 'reserve' a portion of the harvest to avoid issues in availability. For example, Will Meyers from Cambridge Brewing Company was in contact with local pumpkin growers in March and April, well ahead of the August/September harvest dates. This enabled Will to plan his brew schedule far in advance and ensure that he would have enough pumpkins to process and brew when the time came.

Be willing to experiment

Using local ingredients may necessitate extra processes. Brewers who are most successful at sourcing local ingredients are willing to step outside the traditional bounds of brewing. This may include harvesting the ingredient yourself, using an ingredient that is rarely used in brewing, or including extra processes in the brewing.

Supplement local ingredients with non-local

While Massachusetts clearly does not have the capacity to supply 100% of ingredients needed in Massachusetts breweries, establishments with strong local sourcing initiatives have not let this act as an impediment. When having difficulty with sourcing enough local volume (and in particular hops and grains), many brewers see this as an opportunity to blend local and non-local ingredients to create a 'hybrid' flavor profile that includes at least a portion of Mass-grown ingredients.

Utilize a pilot batch system

Using local ingredients presents the unique challenge of determining the flavor impact on the brew. Sourcing from small, local farms means ingredients may have unique characteristics, which are determined by growing conditions and 'terroir'. This makes many brewers reluctant to use local ingredients, however a pilot batch system acts as a 'tester' to eliminate the uncertainty. For example, John Goodfellow from Goodfellow's Brewing uses a custom made 1-barrel pilot batch system. This was used to test the strength and effect locally-grown blackberries would have on a

much larger batch of beer. After determining the right quantities, he scaled his recipe for his 30-barrel system.

Best Practices for Growers

Use the tools provided in this report

For growers who are looking to supply local brewers, this report contains informative tools that can be used for research and business decision making in the Massachusetts craft beer economy. Growers should be mindful of nearby brewers; a list of Massachusetts brewers with their addresses (Appendix 3) can help growers find brewers which are closest to them or operate in the region. Additionally, a separate list details exactly which brewers are using exactly which local ingredients, can help growers identify potential customers (Appendix 4). The ingredient spreadsheet, found in Appendix 1, informs growers which local ingredients are most popular with brewers, what market opportunities are yet to be filled, and what the average price points for each ingredient are.

Work with brewers to customize solutions

Growers who can bring ingredients further along in the supply chain, either through processing or transporting, make it much easier for brewers to source local ingredients. Ben Roesch from Wormtown Brewing Company in Worcester worked with a farmer to combine manual and machine labor to process pumpkins at a manageable cost. The grower also delivers regionally to school districts, allowing him to deliver the processed pumpkins directly to Wormtown Brewery. The processing and delivery of ingredients makes sourcing local ingredients much easier and less costly for brewers.

Adjust volume and price point for farm-to-brewery business model

89% of specialty ingredients used by Massachusetts brewers can be sourced in Massachusetts. Many growers that produce specialty ingredients sell directly to consumers with small packaging sizes and high per-unit prices. Brewers, on the other hand, need large volumes that reduce their per-unit prices in order to financially afford using local ingredients. Growers who are looking to supply breweries need to consider wholesale pricing.

Insights from Case Studies

Wormtown Brewing Company

Ben Roesch, headbrewer of Wormtown Brewing Company, has found success is overcoming many of the challenges in sourcing local ingredients. Through fostering relationships with growers, he is able to bring ingredients further along in the preparation process. For example, his blueberry grower packages and freezes blueberries in 6 lb bags, which caters to the exact weight Ben needs for brewing. The freezing not only protects the freshness, but breaks down the cell wall so the blueberries can be used whole without crushing or maceration. Additionally, Ben has found a pumpkin grower who owns a large food processor that has the capacity to process pumpkins very quickly in large quantities. Since the grower delivers to Western MA school districts, Ben often has his pumpkins delivered for free.

Ben has also found that his beers, which include at least one locally-grown ingredient, are popular with farm-to-table restaurants, which are looking to supplement their local menus with local beers made with local ingredients.

Cambridge Brewing Company

Will Meyers, headbrewer of Cambridge Brewing Company is one of the state's most seasoned commercial brewers with over 20 years of experience. Throughout his tenure at CBC, he has found a myriad of solutions to working with local ingredients. Where quality and consistency are issues, particularly in using local grains, Will carefully blends local grains with non-local grains to keep his brews within a certain beer style. In order to ensure availability when using specialty ingredients, such as pumpkins, berries, or even heather flowers, Will stays in contact early and often with his growers to check on harvest dates and 'reserve' a portion of the crop far in advance.

Since local hops come in a fresh, whole flower form (as opposed to pelletized), Will has experimented with creative and unique methods of incorporating them in his beers. After drying the hop flowers, he uses a hammer mill to crush the hops into a powder, which is then used in the kettle. He has also used a large stainless steel cage, which is filled with hops and dipped into the kettle, acting as a large tea ball. Finally, Will has used a hop back, which is a closed extraction system where wort gets pumped through a 'hop filter'.

[1] http://quickstats.nass.usda.gov/results/5C4F5BCE-F792-3DA1-B564-87953BA82CE0?pivot=short_desc

[2] http://www.nass.usda.gov/Publications/Todays_Reports/reports/land0813.pdf

[3] <http://usda01.library.cornell.edu/usda/current/FarmLandIn/FarmLandIn-02-19-2013.pdf>

Current/future benefits derived from the project

Brewer/grower materials

This project has created a variety of tools and materials that will inform brewers and growers about the supply and demand of Massachusetts grown ingredients, as well as facilitate relations between the two. These materials include a list of growers supplying local ingredients, a list of brewers using local ingredients as well as a list of agricultural products detailing their average price points and the total volume sourced in state/out of state.

List of growers

A list of growers was developed through gathering survey responses (Appendix 2). The list serves as a contact sheet of growers supplying brewing ingredients to brewers in Massachusetts. The list is widely recommended amongst the brewing community; all three case study participants recommended a list of growers be created to help brewers source more local ingredients. When asked 'What challenges do you face when sourcing local ingredients?', 65% of respondents said sourcing (finding a farm), and 78% of respondents said volume/availability. Furthermore, one of the lengthiest tasks in sourcing local ingredients is finding a grower. Two of the case study participants described the process of calling several farms across the state as lengthy, tiresome and at times, discouraging. The list of growers is an important tool that can help brewers overcome both of these challenges. Once brewers responded 'yes' to using a particular local ingredient, they were asked which farm the produce was from. 64% of responses that said 'yes' to using a particular local ingredient included information about the grower they were using; brewers who didn't provide the name of the farm may have done so to protect the identity of their sources for quality or availability purposes.

List of brewers

A list of brewers using local ingredients was collected through gathering survey responses. A spreadsheet was developed (Appendix 1) that details which brewers are using which local ingredients. This list is very helpful for growers, who will then know who to reach out for if they have particular ingredients in supply or are interested in developing a brewer-grower connection. A list of brewers would similarly benefit the brewing community. The list serves as a reference sheet for developing a 'local brewing network' in Massachusetts, through which brewers can share grower contacts, share brewing methods and collaborate on brews.

Agricultural products

A comprehensive list of agricultural products currently being used by Massachusetts craft brewers was developed, found in Appendix 1. The list details all ingredients, (including hops, grains and specialty ingredients) the volumes sourced locally and non-locally, and the value of locally and non-locally sourced ingredients. This tool is beneficial to both growers and brewers.

Growers have the ability to see which agricultural products are highest in demand amongst MA brewers, which ingredients have the highest potential to be sourced in state, as well as the average price points for each ingredient. This list provides growers with the information necessary to make key business decisions regarding their ability to supply the MA craft brewing industry.

Brewers can use this list to see what brewing ingredients are available in Massachusetts, as well as what price they can expect to pay for said ingredients. Similar to growers, this information helps brewers determine the feasibility of working with local ingredients. 70% of survey respondents claimed that cost was one of their biggest concerns when sourcing local ingredients. This list of ingredients can help manage brewers' cost expectations and hopefully alleviate some of the price concerns of working with local ingredients.

Building awareness in the growing and brewing community

This project has and will continue to build awareness about Massachusetts farms connecting with Massachusetts brewers. Through project outreach, many more farmers and growers are knowledgeable about the 'buy local' activity happening in the state, which develops their interest in using local ingredients that may lead brewers to conduct a 'feasibility study' of using local ingredients in their operation.

With dozens of brewers going through this process and joining the local sourcing trend, local farmers are sure to see more brewers as customers.

Increase in local grown and used crops, leading to supply chain creation and lower prices

As more brewers engage in sourcing ingredients locally boosting demand, growers have another option for the sale of their products and if profitable, can increase production. Additionally, as recommended in 'Best Practices for Growers', some farmers may start portioning their offerings in a form that brewers need; in larger quantities and lower per-unit costs. Also in the 'Best Practices' section, some growers may begin offering processing and/or delivery services, which makes sourcing local ingredients much more feasible for brewers. The combination of increased demand leading to increased supply and streamlining the craft beer supply chain could have a 'snowball' effect; as these practices continue to be implemented, awareness increases and local sourcing will continue to increase. The bottom line of course is how the sales of these products fits into the overall diversified farm plan.

Increased networking in local agriculture and brewing industries

The list of brewers using local ingredients and growers supplying MA brewers, alongside the promotion of local ingredients through newsletters, the MDAR website and including this information at both grower and craft beer meetings will increase awareness of this opportunity. In addition, MDAR has developed a consumer Craft Beer Trail highlighting those that use local ingredients, to build awareness and sales for craft brewers.

Recommendations for Future Research and Next Steps

Expanded list of farmers supplying brewers

As detailed in the 'Brewer/grower materials' under the 'Current/future benefits' section, a list of MA farmers supplying the state's craft brewing industry was developed. While we were able to gather a list of 17 growers for 13 of the 19 ingredients, there is much opportunity for this list to be expanded. While some brewers may be protecting their sources for quality/availability reasons, other brewers may be willing to share their sources to expand business opportunities for these growers.

'Online marketplace'

An 'online marketplace' for local ingredients would be an excellent tool for providing brewers and growers with information about real-time supply and demand. For instance, brewers could use the marketplace to enter a post asking for certain local ingredients, in the volume and price needed. Similarly, growers who have ingredients available could enter a post describing their produce and the volume and price point available. If brewers are unable to find a farmer to work with from the 'Grower List', the online marketplace would act as a second resource for finding local ingredients without investing a great deal of time and resources in the process.

While not particularly geared towards brewing ingredients, many of these online marketplaces exist in other parts of the country. Vista Marketplace (<http://vista.locallygrown.net/>), operating in South Carolina, allows growers to display their goods online by describing what is available and providing photos and prices. The marketplace is currently operated by volunteers. Red Hills Online Market (<http://www.localfoodmarketplace.com>), out of Tallahassee, Florida, works similarly to Vista Marketplace, however charges a yearly \$25 'stall fee' plus 15% of sales, which funds the website and delivery of produce from Tallahassee to customers.

Grower representative

Since much of the effort to source locally is initiated on the 'demand' side (brewers), the supply side (growers) need to find additional ways to market their products to the brewing community. This can be done through a paid advocate for farmers. This representative would act for several growers; the representative would keep an up-to-date catalogue of ingredients available from growers, who would then be able to perform marketing and sales duties that growers aren't capable of. These advocates could build and maintain relations with smaller buyers and expand the horizons of the 'buy local' movement.

Description of Project Beneficiaries

Brewing establishments

At the close of the project, December 2013, there was a total of 71 brewing establishments operating in the state of Massachusetts. Of this, 14 were contract

brewers; that is, they brew beer at another brewery's establishment. The full list of brewers can be found in Appendix 3.

Local farms and processing businesses

Any farm in the state of Massachusetts growing hops, grains or specialty ingredients (found in Appendix 1) may benefit from this project. Through survey responses, a list of farms currently supplying the MA craft brewing industry was developed, found in Appendix 2.

Valley Malt, a micromaltster out of Hadley opened in September 2010, becoming the first of its kind on the East Coast. Valley Malt's operation is central to the MA craft brewing industry; without them, brewers in the state would not be able to source local malt. In 2011, they malted about 30 tons of grains, and as demand grows for their product, they continue to expand their capacity. While prices for local malt are much higher than their 'malting factory' counterparts, there remains a dedicated group of brewers who are willing to pay the price premium for the fresher, earthier ingredients that Valley Malt produces. With the 'buy local' initiative growing throughout the state, Valley Malt will surely see an increase in purchases from MA craft breweries.

Ingredient volume and cost

	Ingredient	Unit	Total volume	Total value	Local volume	Local value	Non-local	Non-local	Average price	Average price	Percentage sourced	Percentage sourced
							volume	value	(sourced nationally)	(sourced locally)	locally (by volume)	locally (by value)
Summary of survey results	Hops	lb.	263,888	\$2,040,027	1,092	\$16,908	262,796	\$2,023,119	\$7.73	\$15.48	0.41%	0.83%
	Barley	lb	26,285,409	\$21,151,711	25,319	\$75,200	26,260,090	\$21,076,511	\$0.80	\$2.97	0.10%	0.36%
	Rye	lb.	31,946	\$27,437	2,098	\$2,882	29,848	\$24,555	\$0.86	\$1.37	6.57%	10.50%
	Wheat	lb.	269,286	\$721,715	14,924	\$21,614	254,363	\$700,101	\$2.68	\$1.45	5.54%	2.99%
	Other grains	lb.	1,078,948	\$1,007,797	2,188	\$635	1,076,760	\$1,007,161	\$0.93	\$0.29	0.20%	0.06%
	Apples	lb.	123,252	\$231,830	123,252	\$231,830	-	\$0	\$1.88	\$1.88	100.00%	100.00%
	Blubberies	lb.	2,298	\$14,146	2,298	\$14,146	-	\$0	\$6.16	\$6.16	100.00%	100.00%
	Cranberries	lb.	2,172	\$5,720	2,172	\$5,720	-	\$0	\$2.63	\$2.63	100.00%	100.00%
	Grapes	lb.	302	\$83			302	\$83	\$0.28		0.00%	0.00%
	Herbs	lb.	2,803	\$9,361	2,441	\$8,686	363	\$675	\$3.34	\$3.56	87.07%	92.79%
	Chocolate	lb.	787	\$2,280			787	\$2,280	\$2.90		0.00%	0.00%
	Honey	lb.	2,604	\$10,212	1,164	\$4,545	1,440	\$5,667	\$3.92	\$3.90	44.71%	44.50%
	Maple sugar	gal	1,366	\$49,095	1,152	\$37,341	214	\$11,754	\$35.94	\$32.40	84.36%	76.06%
	Oysters	lb.	976	\$6,050	976	\$6,050	-	\$0	\$6.20	\$6.20	100.00%	100.00%
	Peaaches	gal.	15	\$830			15	\$830	\$55.00		0.00%	0.00%
	Pumpkins	lb.	36,851	\$26,246	15,760	\$10,574	21,092	\$15,673	\$0.71	\$0.67	42.77%	40.29%
	Raspberries	lb.	2,415	\$6,045	2,415	\$6,045	-	\$0	\$2.50	\$2.50	100.00%	100.00%
	Spruce tips	lb.	222	\$3,803	222	\$3,803	-	\$0	\$17.12	\$17.12	100.00%	100.00%
Strawberries	lb.	976	\$1,464	976	\$1,464	-	\$0	\$1.50	\$1.50	100.00%	100.00%	
			\$25,315,852		\$330,203		\$36,962					

Massachusetts growers currently supplying MA craft brewers						
Ingredient/Farm	Address	Contact	Telephone Number	Website	E-mail	
Hops						
4 Star Farms	496 Pine Meadow Rd, Northfield	Gene L'Etoile	(413) 498-2968	http://fourstarfarms.com/		
Nyben Farmers						
Clover Hill Farm	1096 Barre Road, Hardwick	Steve Prouty	(978) 257-2390		cranaussie@aol.com	
Barley						
Valley Malt	4 Cemetery Road, Hadley	Andrea/Christian Stanley	(413) 349-9098	http://valleymalt.com/	andrea@valleymalt.com	
4 Star Farms	496 Pine Meadow Rd, Northfield	Gene L'Etoile	(413) 498-2968	http://fourstarfarms.com/		
Rye						
Valley Malt	4 Cemetery Road, Hadley	Andrea/Christian Stanley	(413) 349-9098	http://valleymalt.com/	andrea@valleymalt.com	
Wheat						
4 Star Farms	496 Pine Meadow Rd, Northfield	Gene L'Etoile	(413) 498-2968	http://fourstarfarms.com/		
Valley Malt	4 Cemetery Road, Hadley	Andrea/Christian Stanley	(413) 349-9098	http://valleymalt.com/	andrea@valleymalt.com	
Other grains						
Valley Malt	4 Cemetery Road, Hadley	Andrea/Christian Stanley	(413) 349-9098	http://valleymalt.com/	andrea@valleymalt.com	
Marini Farm	259 Linebrook Road, Ipswich		(978) 356-0430	http://www.marinifarm.com/	mjmarini@yahoo.com	
Apples						
Box Hill Farm	945 Little Rest Rd., Warren		(617) 448-1010		pjpaturzo@aol.com	
Pine Hill Orchards	248 Greenfield Rd, Colrain	David Shearer	(413) 624-3325	http://www.farmfresh.org/food/	pinehil@hotmail.com	
Blueberries						
Vandervalk Farm	25 Lovell St., Mendon	Martin Vandervalk	(508) 478 8733	http://www.vandervalkfarm.com/	vandervalk@comcast.net	
Cranberries						
Makepeace Farm	158 Tihonet Road, Wareham	Kim Houlette	(508) 295-1000	http://admakepeace.com/makepeace	information@admakepeace.com khoudlette@admakepeace.com	
Herbs						
Atlantic Spice	2 Shore Rd, North Truro		(800) 316-7965	http://www.atlanticspice.com/	weborders@atlanticspice.com	
Honey						
MA Beekeepers Association	428 Salisbury St., Holden	Barbara MacPhee	(508) 829-4556			
Oysters						
Island Creek Oysters	PO Box 348, Duxbury	Skip Benning	(781)934-2028	http://islandcreekoysters.com/	info@islandcreekoysters.com	
Raspberries						
Nourse Farms	41 River Road, Whately	Tim Nourse	(413) 665 2658	http://noursefarms.com/	info@noursefarms.com	
Cape Cod Cranberry Growers Assn	3203-B Cranberry Highway, East Wareham	Dawn Gates-Allan	(508) 759-1041 x12	www.cranberries.org	dgatesallen@cranberries.org	
MA Fruit Growers Association	135 Pine Hill Road, Chelmsford	Mark Parlee, Parlee Farms	(978) 256-2859		stberries@aol.com	
MA Maple Producers Association	Plainfield	Winton Pitcoff	(413) 628-3912	http://massmaple.org	winton@massmaple.org	
NE Apple Association	Hatfield	Bar Weeks	413-247-3232	www.newenglandapples.org	bar@newenglandapples.org	
MA Cultivated Blueberry Growers	577 Growin Drive, Holliston	Elizabeth Patt	(508)429- 6795	http://www.mcbga.com/	eap1226@aol.com	
New England Vegetable Growers	South Deerfield	John Howell	(413)665-3501	howell@umext.umass.edu		
Pioneer Valley Growers Assoc.	South Deerfield	Mary Jo Barrington	(413)6654047	mimbna@aol.com	http://www.pvga.net/	
Pumpkins	Joe Czajkowski Farm, Hadley	Joe Czajowski	(413) 237-2615	debacz@aol.com	http://www.farmfresh.org/food/farm.php?farm=1785	

Brewery Name	Address	Town	Zip Code	Phone Number
Greater Boston				
1 Boston Beer Works	61 Brookline Avenue	Boston	02215	617.536.2337
1 Boston Beer Works (2)	112 Canal St.	Boston	02114	617.896.2337
1 Boston Beer Works (3)	Logan Airport - Terminal C	Boston	02128	617.567.2337
1 Deadwood Café and Brewery	820 Morrissey Blvd	Dorchester	02122	617.825.3800
1 Hingham Beer Works	18 Shipyard Drive	Hingham	02043	781.749.2337
1 Framingham Beer Works	345 Cochituate Road	Framingham	01702	508.309.3373
1 Blue Hills Brewery	1020 Turnpike St #3B	Canton	02021	781.821.2337
1 Cambridge Brewing Company	1 Kendall Sq. Bldg 100	Cambridge	02139	617.494.1994
1 Harpoon Brewery	306 Northern Ave	Boston	02210	888.427.7666
1 Idle Hands Craft Ales LLC	3 Charlton St, Unit 4	Everett	02149	617.819.4353
1 Jack's Abby Brewing, LLC	81 Morton St	Framingham	01702	508.872.0900
1 John Harvard's Brewhouse	33 Dunster St.	Cambridge	02138	617.868.3585
1 Mystic Brewery LLC	174 Williams St	Chelsea	02150	617.800.9023
1 Night Shift Brewing, Inc.	3 Charlton St, Unit 9	Everett	02149	617.294.4233
1 Samuel Adams	30 Germania Street	Boston	02130	617.368.5000
1 Sherwood Forest Brewers Limited	655 Farm Road	Marlboro	01752	508.466.8082
1 Trillium Brewing Co.	369 Congress Street	Boston	02210	617.417.2996
1 Watch City Brewing Company, Inc.	256 Moody Street	Waltham	02453	781.647.4000

North of Boston				
1 Cape Ann Brewing Company, Inc	11 Rogers Street	Gloucester	01930	978.282.7399
1 Cody Brewing Company, LLC	36 Main St	Amesbury	01913	978.836.6965
1 Do Can Brewery LLC	44 Stedman St., Unit 4	Lowell	01851	508.572.0425
1 Enlightenment Ales, Inc.	45 Meadowcroft St	Lowell	01852	(413) 250-9355
1 The Tap Brewing Company (Haverhill Brewery)	100 Washington Street	Haverhill	01832	978.373.2337
1 Lowell Beer Works	203, Cabot St.	Lowell	01854	978.937.2337
1 Salem Beer Works	278 Derby St.	Salem	01970	978.745.2337
1 Ipswich Ale Brewery (Mercury)	23 Hayward Street	Ipswich	01938	978.356.3329
1 Newburyport Brewing Company	4 New Pasture Road	Newburyport	01950	978.463.8700
1 Bog Iron Brewing, LLC	33 West Main St, Unit F	Norton	02346	508.291.5137
1 Riverwalk Brewing Corporation	36 Main Street	Amesbury	01913	978.499.2337

South of Boston, Cape Cod & the Islands				
1 Berkley Beer	17 Cottle St.	Berkley	02779	508.326.9954
1 Buzzards Bay Brewing	98 Horseneck Road	Westport	02790	360.648.2224
1 Cape Cod Beer, Inc.	1336 Phinney's Lane, Unit 2-2	Hyannis	02601	508.790.4200
1 Cisco Brewers, Inc.	5 Bartlett Farm Road	Nantucket	02554	508.325.5929
1 Mayflower Brewing Company, LLC	12 Resnik Road	Plymouth	02360	508.746.2674
1 Offshore Ale Company (Vineyard Brewing Co.)	30 Kemebec Ace	Oak Bluffs	02557	508.693.2626

Central MA				
1 Gardner Ale House	74 Parker Street	Gardner	01440	978.669.0122
1 Kretschmann Brewing Company, LLC	294 Thompson Road	Webster	01570	508.671.7711
1 Nashoba Valley Sprits, Ltd.	92 Wattaquodock Hill Road	Bolton	01740	978.779.5521
1 Pioneer Brewing Company, LLC	195 Arnold Road	Fiskdale	01518	508.347.7500
1 Tree House Brewing Company, LLC	63 St. Clair Road	Brimfield	01010	413.949.1891
1 Wachusett Brewing	175 State Road East	Westminster	01473	978.874.9965
1 Wornatown Brewery LLC	455B Park Ave	Worcester	01610	774.239.1555

Western MA				
1 Amherst Brewing Company, Inc.	10 University Drive	Amherst	01002	413.253.4400
1 Barrington Brewery	420 Stockbridge Rd, Suite 7	Great Barrington	01230	413.528.8282
1 Berkshire Brewing Company	12 Railroad Street	South Deerfield	01373	413.335.3208
1 Big Elm Brewing	65 Silver Street	Sheffield	01257	413.229.2348
1 Element Brewing Company, LLC	30 Bridge Street	Millers Falls	01349	413.835.6340
1 Glass Bottom Brewery, LLC	480 Pleasant Street	Lee	01238	617.680.9785
1 High Horse Brewing	24 North Pleasant Street	Amherst	01002	413.230.3034
1 Lefty's Brewing Company	301 Wells Street	Greenfield	01301	413.475.3449
1 Northampton Brewery	11 Brewster Court	Northampton	01060	413.584.9903
1 Opa Opa Brewing	4 Main Street	Williamsburg	01096	413.527.8282
1 Paper City Brewing Company, Inc.	108 Cabot Street	Holyoke	01040	413.535.1588
1 People's Pint (Franklin County Brewing Co)	76 Hope Street	Greenfield	01301	413.773.0333
1 Scantic River Brewery, LLC	25 Mill Dr.	Hampden	01036	413.204.9163
1 Wandering Star Brewing Co., LLC	11 Gifford Street	Pittsfield	01201	917.573.3942
1 Westfield River Brewing Co., LLC	79 Mainline Drive	Westfield	01085	417.374.8452

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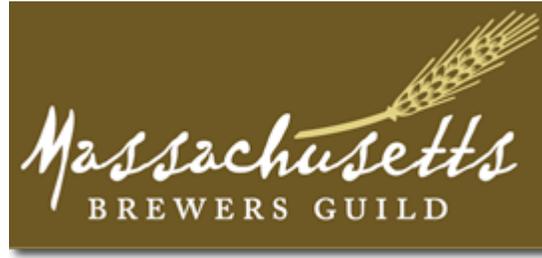
Contract Brewers	
Brewery Name	Phone Number
1 Backlash Beer Company	617.615.9345
1 Banner Beer Co.	617.642.8079
1 Battle Road Brewing	781.999.3906
1 Blatant Brewing	508.737.7854
1 Bay State Brewing Company	617.413.0939
1 Brewmaster Jack	
1 Clown Shoes	978.257.9094
1 Goodfellow's Brewing Co.	774.213.5044
1 High and Mighty	413.323.8040
1 Notch Brewing Co.	978.853.9138
1 Portico Brewing Company	617.383.9049
1 Rapsallion	978.727.7200
1 Somerville Brewing Company	800.428.1150
1 3 Beards Brewing	

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Local Ingredient Usage by Massachusetts Craft Breweries

Brewery Name	Hops	Barley	Rye	Wheat	Other grains	Apples	Blueberries	Cranberries	Grapes	Herbs	Chocolate	Honey	Maple syrup	Oysters	Peaches	Pumpkins	Raspberries	Spruce tips	Strawberries	
Amherst Brewing Company Inc								X									X			
Berkshire Brewing Company Inc	X																		X	
Berkshire Mountain Brewers Inc	X	X												X						
Buzzards Bay Brewing	X					X			X											
Cambridge Brewing Company Inc	X	X	X	X							X		X				X			
Cape Ann Brewing Co Inc											X		X		X		X			X
Cape Cod Beer																				
Cisco Brewers Inc																				
Element Brewing Company					X									X						
Franklin County Brewing Co. Inc	X	X		X	X	X														
Glass Bottom Brewing	X	X	X						X		X			X						X
Goodfellow's Brewing	X							X						X			X			
Haverhill Brewery Inc.														X						
Idle Hands Craft Ales LLC											X			X					X	
Jack's Abby Brewing LLC	X	X																		
Lefty's Brewing Company														X						
Mass Bay Brewing Company						X	X		X		X									X
Mercury Brewing Company	X	X	X	X										X						
Mystic Brewery LLC				X					X											
Nashoba Valley Spirits Ltd														X						
Paper City Brewery Company Inc								X					X	X						
Riverwalk Brewing Co.	X	X																		
Slesar Bros. Brewing Co. Inc								X			X	X								
Vineyard Brewing Company								X												
Wachusett Brewing Company Inc																				
Westfield River Brewing Co	X																			
Wormtown Brewery LLC	X	X	X	X				X						X			X			



2012 Massachusetts Economic Snapshot of the Craft Brewery Industry and Passport Program

Thank you for your time to complete the following survey, which will be aggregated as a total for the industry. **Individual company information will not be shared.** Contact information, businesses description and tour details will be included in the MA Craft Brewery Passport/Trail program.

1. Business name:

Contact:

Title:

Address:

City:

State: MA Zip:

Production Address:

City:

State: MA Zip:

Telephone:

FAX:

Company email:

Contact email:

Website:

2. Business description: Feel free to include your mission statement.

3. What do you produce – check all that apply:

Lager

Wheat beer

Pale ale

Belgian Style (Triple, Double, Etc)

IPA

Saison/Farmhouse Ale

Stout

Porter

Other ales

What else do you produce (please list):

4. Please list the ingredients used in your beer in 2011 and the approximate volume and value:

	Currently Used?	Locally sourced – from whom: what farm (or your own brewery)?	Total Quantity Sourced	Local Quantity Sourced	Total cost	Cost of ingredients sourced locally	Ideally, when would the product be available?
	Check if yes	Check if yes and contact	(lbs./bushels)	(lbs./bushels)	(\$)	(\$)	(Date/Month)
Hops							
Grains							
Barley							
Rye							
Wheat							
Other							
Apples							
Blueberries							
Cranberries							
Grapes							
Herbs							
Chocolate							
Honey							
Maple Sugar							
Oysters							
Peaches							
Pears							
Pumpkins							
Raspberries							
Spruce Tips							
Strawberries							
Others, please list							

5. Do you have other relationship with growers – for example – collaboration for the removal of spent grain? Please describe and the volume/lbs.

6. How many employees do you have?

Full Time ____ Part Time ____ Volunteer/intern ____

7. Do you conduct tours (or plan to in the future, please describe)?

Yes ____ No ____

What, if any, are the hours/ days during the week for the tours?

Do you offer tastings?

8. Do you want to be included on the Massachusetts Craft Brewery Passport/Trail?

Yes ____ No ____

9. If there are benefits to using local ingredients, what are they?

- | | |
|---|--|
| <input type="checkbox"/> Marketing potential | <input type="checkbox"/> Local/fresh flavor in beer |
| <input type="checkbox"/> Community relations | <input type="checkbox"/> Save on transport/packaging costs |
| <input type="checkbox"/> Commitment to local farms | <input type="checkbox"/> Beer style innovation |
| <input type="checkbox"/> Other (please list/describe) | |

10. What challenges do you face when sourcing local ingredients?

- | | |
|--|---|
| <input type="checkbox"/> Cost | <input type="checkbox"/> Product quality |
| <input type="checkbox"/> Logistics | <input type="checkbox"/> Storage |
| <input type="checkbox"/> Sourcing (finding a farm) | <input type="checkbox"/> Timing/harvest |
| <input type="checkbox"/> Volume/availability | <input type="checkbox"/> Other (please list/describe) |

11. What can the MA Dept. of Agricultural Resources do to assist you in identifying and sourcing local ingredients?

- List farms that supply ingredients of interest
- Create matchmaking events between brewers and growers
- Provide data on current supply and demand
- Other (please list/describe)

12. What was the total dollar value of your sales in 2011? **This information will be presented ONLY as an aggregated value, based on all survey responses.** (Brewpubs, please use sales derived from beer).

13. What was the percentage sold:

In state ____ vs. out of state ____

On premise ____ vs. off-premise ____

Please share any comments:

Thank you for your time! If you have any questions/comments, please contact Bonita.Oehlke@state.ma.us, 617.626.1753 or Phil Marquis Marquis_Phil@bentley.edu, 860.597.9039

Return by email Bonita.Oehlke@state.ma.us or mail to:

Bonita Oehlke, Massachusetts Department of Agricultural Resources
251 Causeway Street, Suite 500 , Boston, MA 02114

This project is coordinated by the MDAR and the MA Brewers Guild with funding support from USDA, Agricultural Marketing Service, Federal-State Marketing Improvement Program, and USDA Rural Development.

USDA Rural Development requests that breweries featured in the Passport Program track civil rights data for current and future employees. Please complete the following table as it represents the current makeup of your organization. Please track this information as you do any new hiring. We will check with you in September 2013 to show any changes.

Ethnicity	Employees	Board of Directors
Hispanic or Latino		
Not Hispanic or Latino		

Total		
Male		
Female		

Race		
American Indian/Alaskan Native		
Asian		
Black or African American		
Native Hawaiian or other Pacific Islander		
White		

Total		
Male		
Female		