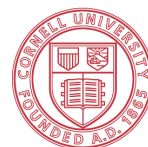


— NEW YORK STATE —

# BREWERY

## SUPPLY CHAIN ANALYSIS

February 2016



Cornell University  
Cooperative Extension  
Harvest New York

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# BACKGROUND

The Farm Brewery Law became effective on January 1, 2013 and was designed to support New York's breweries, increase demand for locally grown farm products, expand the industry, and promote economic development and tourism. Those brewers that operate under the farm brewery license (referred to in this report as farm brewers) benefit from a number of incentives including the exemption from some fees, the opportunity to open satellite locations and the ability to taste and sell other New York labeled beer, wine, cider, and spirits. In order to receive the farm brewer license and these incentives, beer brewed by farm brewers must be made with a certain percentage of NY grown inputs. Until 2018, at least 20% of the hops and 20% of all other ingredients must be from New York. After January 1, 2018, the percentage increases to 60% of the hops and 60% of all other ingredients. On January 1, 2024, the percentage increases to 90% of the hops and 90% of all other ingredients.

Prior to the passage of the legislation, only a few farmers grew malting barley or hops, there were no malt houses, and 95 licensed brewers in the state. In June 2015, there were 250 licensed brewers in New York, 8 operating malt houses that were selling product to brewers, and 32 farmers growing malting barley.

This was a new industry in New York. Malting barley was a new crop for farmers and the best varieties and management practices were not known for New York's climate. Malt houses were new businesses without access to technical assistance and testing support. Farm brewers were small to start without a long history of brewing. These startup challenges for the stakeholders within the supply chain created many questions about the industry's long term needs.

As the industry continued to grow, farmers needed to know how much demand there would be for NY grown inputs, malt houses needed to know how much malt brewers would need, and brewers needed to know what types of NY grown products would become available. Since this market was brand new there was no long-term data to help guide this new industry which led to projections on quality, quantity and price based on the best available information at the time.

As the industry becomes more established, it is possible to look back over the last three years and answer these initial questions. Also, it is better known now what some of the challenges are and how they can be addressed to ensure success for all the stakeholders within the supply chain.

## EXECUTIVE SUMMARY

Following the passage of New York's Farm Brewery Law in 2013, new markets developed for malting barley farmers, malt house operations and farm breweries. As these new markets developed, grain quality, quantity and price projections for the industry were made based on the best available information at the time. However, it was clear that a more comprehensive market analysis was needed in order to best support this growing industry. This report summarizes the data gathered through that analysis.

The number of acres planted with malting barley across New York State continues to increase every year. The greatest barrier to market growth for farmers is the uncertainty about market demand. If there is a certain market demand, farmers are willing to devote additional acreage to growing malting barley. Farmers are planting both 2-row and 6-row malting barley with more acreage in 2-row. Malt houses and brewers overwhelmingly prefer 2-row. Additionally, farmers are growing several other grains intended for the brewing and distilling market.

Proper malting barley storage creates several challenges for farmers and malt houses. Farmers have access to proper storage but are unable to devote much space to malting barley because they are storing it for long periods of time since malt houses do not have the onsite storage capacity to accept large grain deliveries. Additionally, farmers have to store varieties separately, and cleaning and drying requirements are different from other small grains. Malt houses are storing finished malt for long periods of time due to unpredictable patterns of demand and smaller quantity demand from brewers.

# EXECUTIVE SUMMARY continued

There is a need for secondary markets for malting barley that does not meet malting grade. Currently farmers have limited or no market for their malting barley that cannot be malted. In 2013 and 2014 most farmers either covered costs or lost money growing malting barley.

Malt houses are not currently operating at full capacity but have plans to grow and to produce more specialty malts. Malt houses are producing base malt at a much higher level than specialty malts. Brewers are interested in sourcing more specialty malts since that makes up a large percentage of their grain bill. Additionally, malt houses plan to malt other grains intended for the brewing market.

In 2014, the data indicates that there was enough malting barley grown in the state to meet the current 20% NY grown input requirement for farmer brewers. However, based on barrel and grain quantity projections, farmers will need to commit significantly more acreage than what is currently planned to malting barley to meet projected demand. This is because farm brewers are growing in number and production rapidly and the demand for NY grown inputs (malt and hops) is not generated from only farm brewers. The majority of others brewers that responded said that they already buy or plan to buy some NY grown inputs (malt and hops), with that demand also growing steadily.

Of the incentives associated with the Farm Brewery Law, farm brewers rank the ability to sell beer by the glass as the most valued license incentive. Without additional incentives added, the majority of the brewers responded that they will switch or combine licenses. However, brewers indicated that if price, quality and availability of specialty malts becomes consistent they are likely to remain as farm brewers.

When it comes to sourcing local malt, quality, quantity and price were closely ranked with quality leading slightly as the number one concern among brewers. For hops, price and quality were closely ranked with price slightly leading as their first concern. On average, brewers are paying a premium for NY grown malting barley. Brewers are willing to pay a little more for NY grown inputs and in return they believe that their consumers would be willing to pay a slight premium for beer brewed with NY grown inputs. At the same time, consumers are interested in knowing which beers are produced with local ingredients and brewers think that a specialty logo for these NY grown beers would be helpful to raise awareness and promotion of the product.

## METHODOLOGY

In the spring of 2015, Cornell Cooperative Extension Harvest NY surveyed the members of the malting barley supply chain in New York (farmers, malt houses, and brewers). This report summarizes that information. In collaboration with Cornell University, Cornell Cooperative Extension, Empire State Development, Hartwick College Center for Craft Food and Beverage, New York State Brewers Association, NY Craft Malt, and PM Farms, three separate surveys were developed.

Electronic surveys were emailed to 32 malting barley farmers, 8 operational malt houses, and approximately 250 breweries. The contact list for farmers and malt houses was provided by Cornell Cooperative Extension field crop production specialists across the state. Some breweries hold multiple licenses so there are some businesses duplicated within that number, but it is only a few.

Survey response rate: 28 malting barley farmers (88%), 8 malt houses (100%), and 80 breweries (31%).

## LIMITATIONS

The response rate from brewers was low and faded over the course of the survey with a smaller percentage completing the whole survey. For this reason, the number of respondents is represented in the brewer figures. This makes it difficult to provide exact malting barley and hops quantity projections however the data shows trends which allow for conservative projections. Additionally, the farmer data is missing information from approximately four growers. So, the current production and acreage information is slightly lower than what is actually planted.

# SUMMARY OF FINDINGS

## BREWERY SUPPLY CHAIN MARKET OPPORTUNITIES

- Additional malting barley acreage needed to meet projected demand
- Proper storage for malting barley farmers is needed
- Additional research and education for farmers, both malting barley and hops, so they can meet quality standards of maltsters and brewers
- Development of secondary markets for malting barley that does not meet malting grade
- Increased storage capacity needed at malt houses
- Increased production of specialty malt options
- Additional research and education for malt houses so they can meet the quality standards of brewers
- Larger quantity per order purchasing by brewers
- Additional education for brewers on gaining access to NY grown inputs
- Development of logo specifically for farm brewers
- Additional education to the consumer on the advantages of buying a beer brewed with NY grown inputs

# MALTING BARLEY PRODUCTION

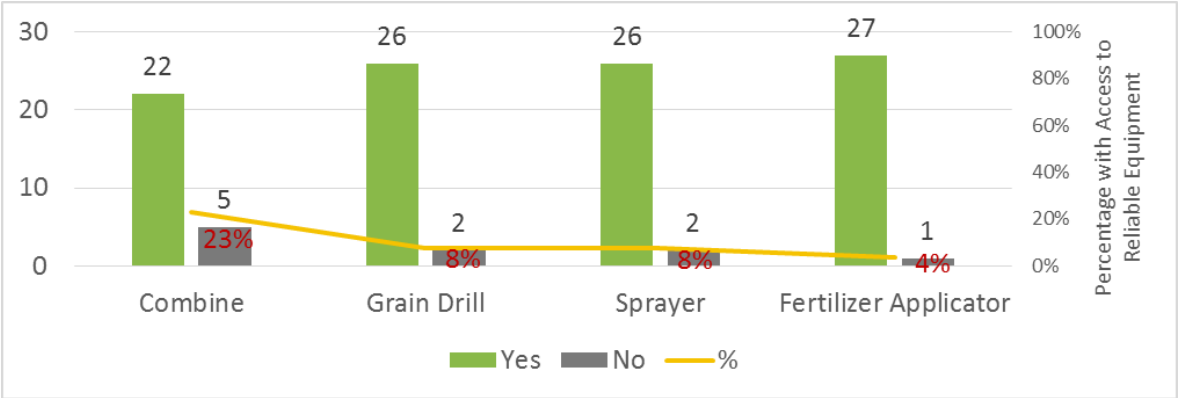
This section summarizes information about the farming operations of malting barley farmers:

- access to equipment
- acres of malting barley planted (current and potential)
- other grains grown for the brewing and distilling market
- market distribution of malting barley
- market growth barriers faced by farmers

## ACCESS TO RELIABLE EQUIPMENT

**Figure 1** represents malting barley farmers' access to reliable equipment. The majority of farmers have access to (they either own or rent) reliable equipment. Malting barley used for malting needs to be free of weed seeds, rocks, and other debris. Proper equipment is important to meet these standards.

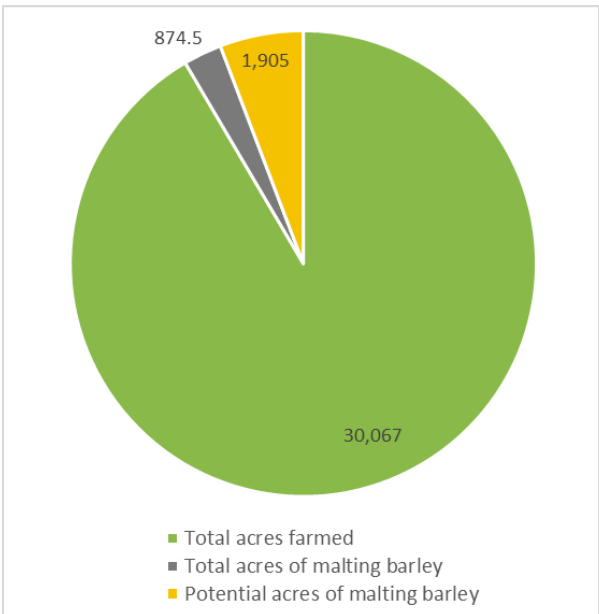
**Figure 1. Access to Reliable Equipment**



## ACRES OF MALTING BARLEY: CURRENT AND POTENTIAL

The majority of farmers growing malting barley are existing diverse cash crop operations and **Figure 2** shows that they have only committed a small amount of acreage to malting barley (in 2015, 874.5 acres). These farmers currently farm a total 30,067 acres (both owned and leased land). If the market is profitable, these farmers said they would be willing to commit 1,905 acres of their farming operation to malting barley.

**Figure 2. Current and Potential Malting Barley Acreage as Part of Existing Farming Operations in NY**



# MALTING BARLEY PRODUCTION

## MALTING BARLEY PLANTED vs MALTING BARLEY MET GRADE

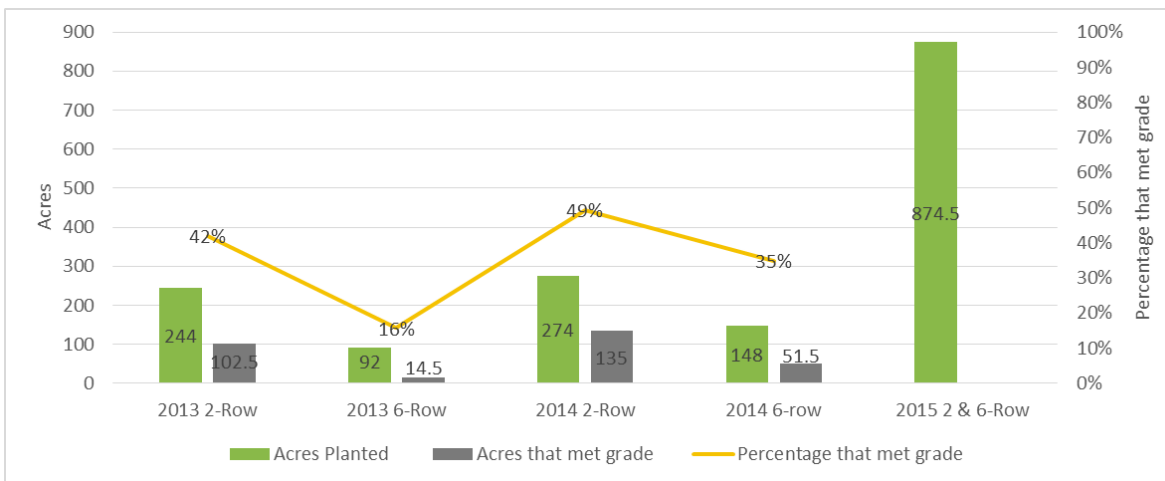
**Figure 3** represents the number of acres of 2-row and 6-row planted in 2013, 2014, and 2015 with the percentage of malting barley that met malting grade in 2013 and 2014 represented.

- In 2013, a total of 336 acres (244 acres of 2-row plus 92 acres of 6-row) was planted with 35% meeting grade (117 acres total: 102.5 of 2-row and 14.5 of 6-row).
- In 2014, a total of 422 acres (274 acres of 2-row plus 148 acres of 6-row) was planted with 44% meeting grade (186.5 acres total: 135 of 2-row and 51.5 of 6-row).
- In 2015, a total of 874.5 acres was planted. The breakdown between 2-row and 6-row is unknown since the survey just asked how many acres of malting barley was planted in 2015. The percentage that met grade is not available since at the time of survey administration, harvest had not yet occurred.

ACREAGE  
MALTING  
BARLEY  
PLANTED

%  
MALTING  
GRADE

**Figure 3. Malting Barley Planted vs Malting Barley Met Grade**



Note: In 2013, there were 34 acres of 2-row planted and the respondent did not indicate what percentage met malting grade so we assumed it to be 0%. Similarly, in 2014 22 acres of 2-row and 18 acres of 6-row were planted and the respondents did not indicate what percentage met malting grade so we assumed it to be 0%. We included this acreage in order to give a complete representation of acres planted but recognize that the percentage that met grade may actually be higher.

The acreage of malting barley planted is increasing across New York. We also see an increase of the percentage that met malting grade in 2014 over 2013.



Cornell harvesting  
2014 spring barley  
variety trials.  
*Photo: Justin O'Dea,  
CCE Ulster County*



# MALTING BARLEY PRODUCTION

## MALT HOUSE AND BREWER GRAIN PREFERENCE



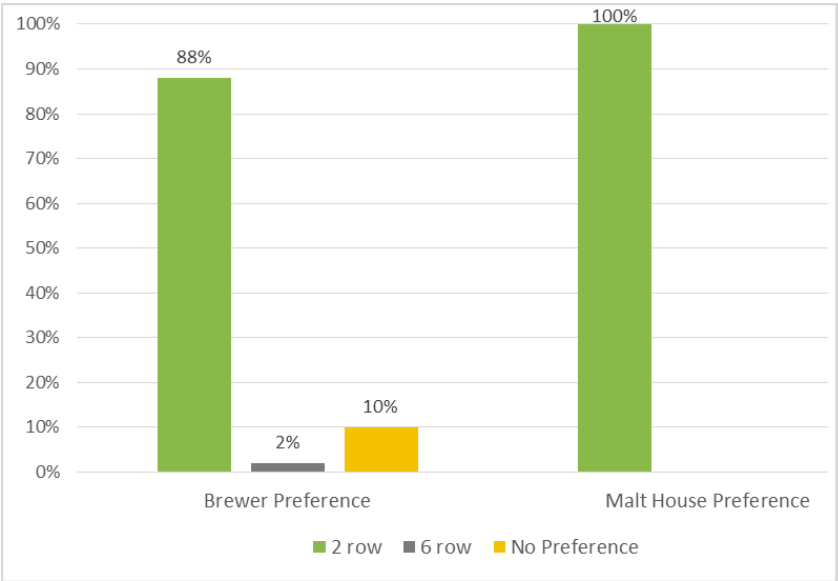
2-row barley head.  
Photo: Justin O'Dea,  
CCE Ulster County



6-row barley head.  
Photo: Justin O'Dea,  
CCE Ulster County

We asked brewers and malt houses if they prefer to brew and malt with 2-row, 6-row or had no preference. **Figure 4** illustrates that 88% of brewers prefer 2-row, 2% (which represents only 1 brewer) prefers 6-row, and 10% (which represents 4 brewers) have no preference. All malt houses said that they prefer to malt with 2-row.

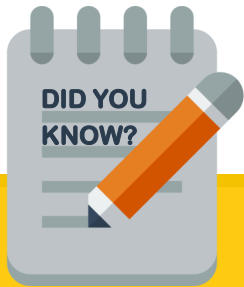
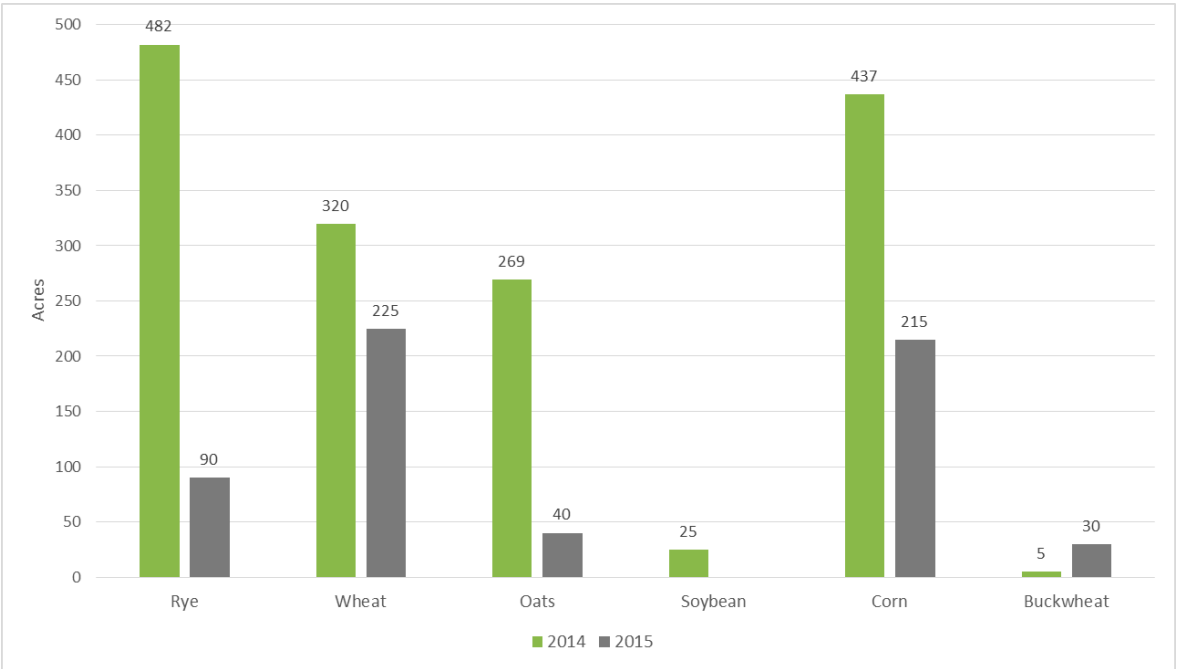
Figure 4. Brewer and Malt House 2-row or 6-row Malting Barley Preference



## OTHER GRAINS GROWN FOR BREWING

Malting barley farmers are growing other grains intended for the brewing and distilling market. Broken down by grain, **Figure 5** shows the number of acres planted in 2014 and 2015.

Figure 5. Other Grains Grown for the Brewing and Distilling Market



The Farm Brewery Law requires that hops and all other ingredients be grown in New York. Malting barley is the primary grain used to brew beer but additional grains (such as oats and wheat) can also be used and count toward the legislative local requirements.



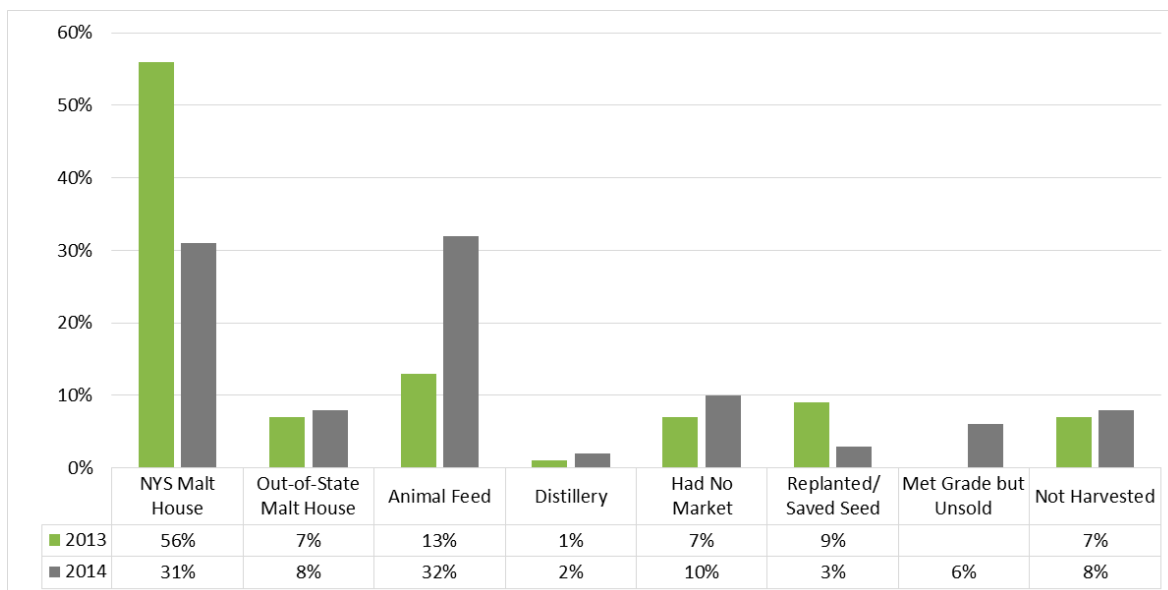
# MALTING BARLEY PRODUCTION

## DISTRIBUTION OF MALTING BARLEY ACROSS MARKETS

**Figure 6** shows that the distribution of malting barley across markets varies between 2013 and 2014, with the greatest change in the New York malt house and animal feed areas. The “had no market,” “replanted/saved seed” and “not harvested” categories represent 23% of the grain in 2013 and 21% in 2014. These represent malting barley that did not meet malting grade, which required a secondary market but had none. While there is some secondary market activity with “animal feed” and “distillery”, these findings indicate that there is a need for additional markets for malting barley that does not meet malting grade.

In 2013, 22% of farmers lost money growing malting barley. In 2014, 35% of farmers lost money. Farmers expressed a need for market development, both secondary markets and increased production capacity at the malt house.

**Figure 6. Distribution of Malting Barley Across Markets**



### MARKET DEVELOPMENT

ADDITIONAL MARKETS FOR MALTING BARLEY THAT DOES NOT MEET MALTING GRADE



INCREASED CAPACITY AT MALT HOUSES

## BARRIERS TO MARKET GROWTH

Farmers were asked to rank their biggest barriers to market growth. Six reasons were provided including:

- Uncertainty about market demand;
- Uncertainty of your ability to grow a crop that meets quality standards of maltsters and brewers;
- Access to seed;
- Access to adequate amount of storage;
- Transportation and delivery; and,
- Other-please list.

The results are illustrated in **Table 1**. The highest scoring reason was “Uncertainty about market demand”, followed closely by “Uncertainty of your ability to grow a crop that meets quality standards of maltsters and brewers”. There were seven additional reasons listed by farmers, four of which received a #1 rank (“Malting”; “Cleaning and drying”; “Other crops are more

# MALTING BARLEY PRODUCTION

## BARRIERS TO MARKET GROWTH continued

profitable”; and, “Viability of the industry”) and the remaining three received a #2 rank (“Weak desire by brewers to use local malts”; “Off-farm infrastructure/malting facilities”; and, “Access to local malt houses”).

**Table 1. Barriers to Market Growth**

Rank	Barrier
1	Uncertainty about market demand
2	Uncertainty of your ability to grow a crop that meets quality standards of maltsters and brewers
3	Access to adequate amount of storage
4	Access to seed
5	Transportation and delivery
6	Malting
7	Cleaning and drying
8	Other crops are more profitable
9	Viability of the industry
10	Weak desire by brewers to use local malts
11	Off-farm infrastructure/malting facilities
12	Access to local malt houses

## MALTING BARLEY ACRES NEEDED TO MEET NY GROWN INPUT REQUIREMENT

In 2014, the estimated total gallon production reported to the NYS Department of Taxation and Finance was 740,000 gallons, representing 45 farm brewers. **Table 2** converts production gallons through to acres and shows that New York needed to grow 186.58 acres of malting barley to meet the farm brewers 20% NY grown input requirement under the Farm Brewery Law. As seen in **Figure 3** on page 7, in 2014 farmers planted 422 acres of malting barley, of which 186.5 met malting grade.

**Table 2. Malting Barley Acres Needed to Meet 20% NY Grown Input Requirement for Farm Brewers**

2014 Production Gallons	In Barrels (31 gallons in a barrel)	Lbs in Malt (68 lbs of malt per barrel of beer)	Malt Lbs at 20% NY Grown	In Grain (1 lbs barley = .75 lbs malt)	Grain in Bushels (43.5 lbs of grain per bushel)	Acres by Bushel (50 bushels per acre)
740,000	23,871	1,623,226	324,645	405,806	9,329	186.58

Note: The Tax Department was not able to separate volumes for brewers with a farm brewer license as well as another license with production <60,000 gallons. So, the production gallons represented in **Table 2** includes some production under other licenses not carrying the 20% NY grown input requirement. Based on the respondents to this survey where 21% of farm brewers carried multiple licenses, it is anticipated that approximately 9 farm brewers represented in **Table 2** also carry another license. Even with this limitation in the data, in 2014 there was enough malting barley being grown in New York to meet the needs of those brewers required to brew with NY grown inputs. For the projection of acreage needed in the future, see **Table 6** on page 19.

# MALTING BARLEY PRODUCTION

## STORAGE CAPACITY AND FACILITIES

Farmers report having 14 million bushels of “proper” malting barley storage available on farm as part of a larger 101 million bushels of total storage capacity (**Figure 8**). Only 71% of farms report using on-farm storage while the remainder (29%) use a combination of on-farm and 3rd party malting barley storage (**Figure 9**).

Figure 8. Storage Capacity of Farmers

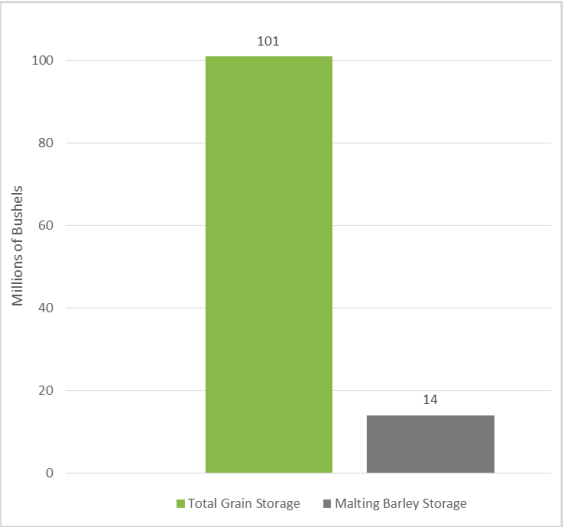
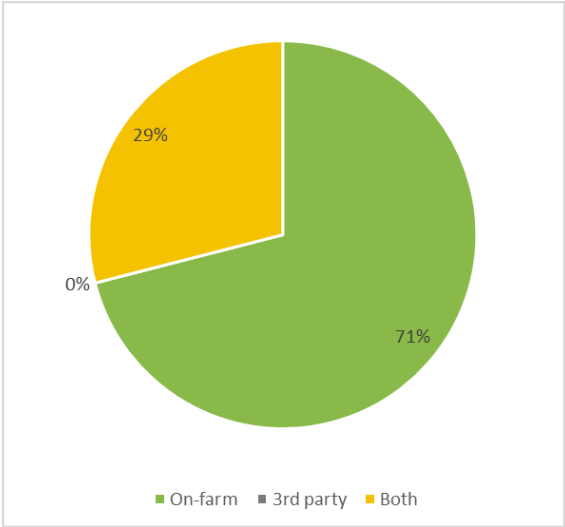


Figure 9. Storage Facility Used



## STORAGE CHALLENGES

Farmers were asked to check which malting barley storage challenges they faced. The following reasons were provided for selection:

- Need to hold malting barley for longer periods due to lack of demand;
- Ability to store varieties separately, due to lack of storage;
- Potential damage from moving the grain between different storage vessels;
- Cleaning;
- Drying;
- Decreased grain viability;
- Molds and mycotoxins;
- Insect damage; and,
- Other.

Farmers could check all that apply. The results are illustrated in **Table 3** which added these selections across all farm responses. The most checked challenge with 17 farmers (representing 74% of respondents) was “Need to hold malting barley for longer periods due to lack of demand” followed closely by “Ability to store varieties separately, due to lack of storage” and “Cleaning” with 14 farmers (representing 61% of respondents) and 12 farmers (representing 52% of respondents) respectively.

# MALTING BARLEY PRODUCTION

## STORAGE CHALLENGES continued

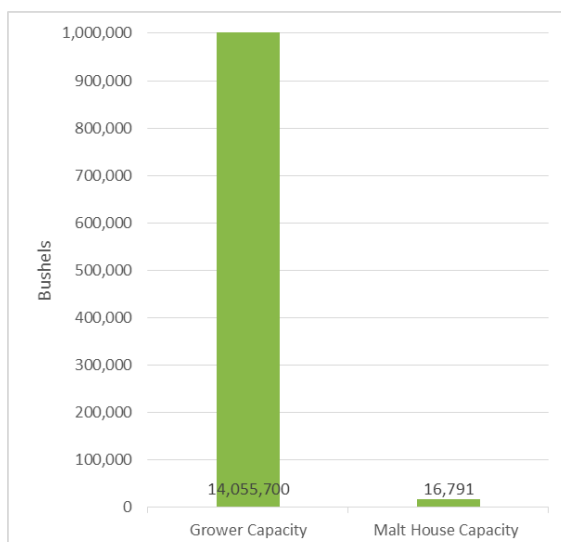
**Table 3. Storage Challenges Faced by Farmers**

Rank	Barrier
1	Need to hold malting barley for longer periods due to lack of demand
2	Ability to store varieties separately, due to lack of storage
3	Cleaning
4	Molds and mycotoxins
5	Potential damage from moving the grain between different storage vessels
6	Drying
7	Decreased grain viability
8	Insect damage

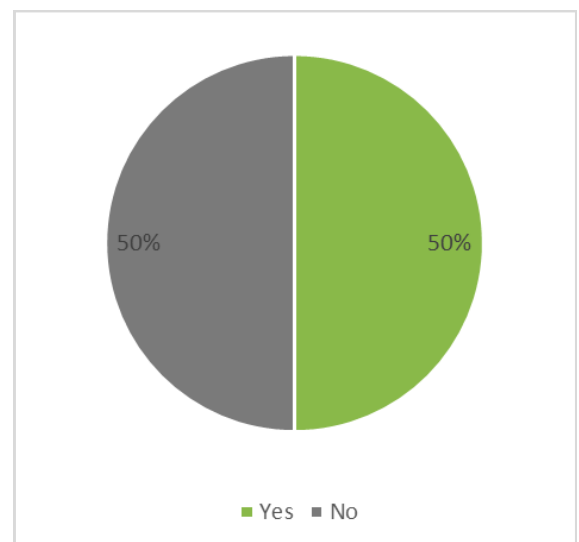
Given the nature of the high malting barley storage capacity illustrated in **Figure 8**, it seems that proper malting barley storage should not be an issue but because this storage is locked up on the farm for long periods of time, it becomes a challenge for the farmers especially since they need that storage space for other grain crops. Comments provided by farmers further confirm that they are depended upon to store malting barley for longer periods of time than ideal since demand is slow and malting facilities, as illustrated in **Figure 10**, do not have the necessary storage capacity onsite to accept and hold a large amount of malting barley.

Reemphasized in **Figure 11**, onsite storage of malt houses is limited because demand for finished malt is slow and they are storing malt for long periods of time. Malt houses commented that there is currently enough NY grown and malted grains to meet more demand but the brewers have not yet made a serious commitment to purchase large quantities of product. Ideally, malt houses would like to sell finished product within one month, but due to low demand, in some cases they are storing finished malt for up to 4 months.

**Figure 10. Malting Barley Storage Capacity (Grower and Malt House)**



**Figure 11. Malt Houses Storing Malt Longer than Desired**



# MALTING BARLEY PRODUCTION

## GRAIN QUALITY ISSUES

Farmers were asked to rank their biggest grain quality issue. Four reasons were provided for ranking, including:

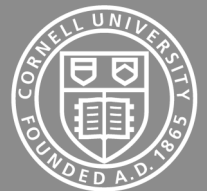
- Protein out of optimal range (optimal range being 9-12%);
- Mold and mycotoxin (DON);
- Plumpness and uniformity of grain; and,
- Low germination and pre-harvest sprouting.

The results are illustrated in **Figure 12**. The highest scoring reason was “Mold and mycotoxin (DON)”.

**Figure 12. Ranking of Grain Quality Issues by Growers**



Malting barley is a relatively new crop to today's farmers and access to best practices and best varieties for growing in NY have been limited. However, Cornell University has started a malting barley breeding program, is conducting variety trials across the state, and is engaged in research to reduce disease and mycotoxin contamination. Additionally, malting barley educational efforts have begun. Through the combination of these programs the grain quality issues listed above will improve.



Plant Pathologist Gary Bergstrom, Cornell University, shares information about malting barley test plots at 2014 Malting Barley Field Day.  
*Photo: Elizabeth A. Tomlin, Country Folks*

# MALT PRODUCTION

This section summarizes operational information about up and running malt houses across New York:

- current and actual capacity
- malt variety production
- malting of other grains for the brewing industry
- distribution across markets

## CURRENT AND ACTUAL CAPACITY OF MALT PRODUCTION

Current and actual capacity of malt houses is illustrated in **Figure 13**. They are currently operating at about 50% capacity. Listed here are the types of malt currently produced with the majority being base malt at 85% of all malt production. Specialty malts are currently produced but in much lower quantities. Wheat, rye and light, medium munich are currently at 4% each of all malt produced. With cara-pils at 2% and light, medium, dark roast at 1%.

**Figure 13. Current and Actual Capacity of Malt Production in New York**



## DEMAND FOR NY SPECIALTY MALT AS IDENTIFIED BY BREWERS

Surveyed brewers were asked...

If specialty malts become available in NY, what types would you purchase from NY malt houses and in what projected quantity?

In addition to the responses listed in **Table 4** from surveyed brewers, brewers stated that a significant amount of their grain bill is specialty malt and having access to those specialty malts is important to ensure their high adoption of local malt. **Table 4** is not provided to represent the actual pounds of demand but rather to show brewers' interest in a wide array of specialty malts.

**Table 4. Demand for NY Specialty Malt as Identified by Brewers**

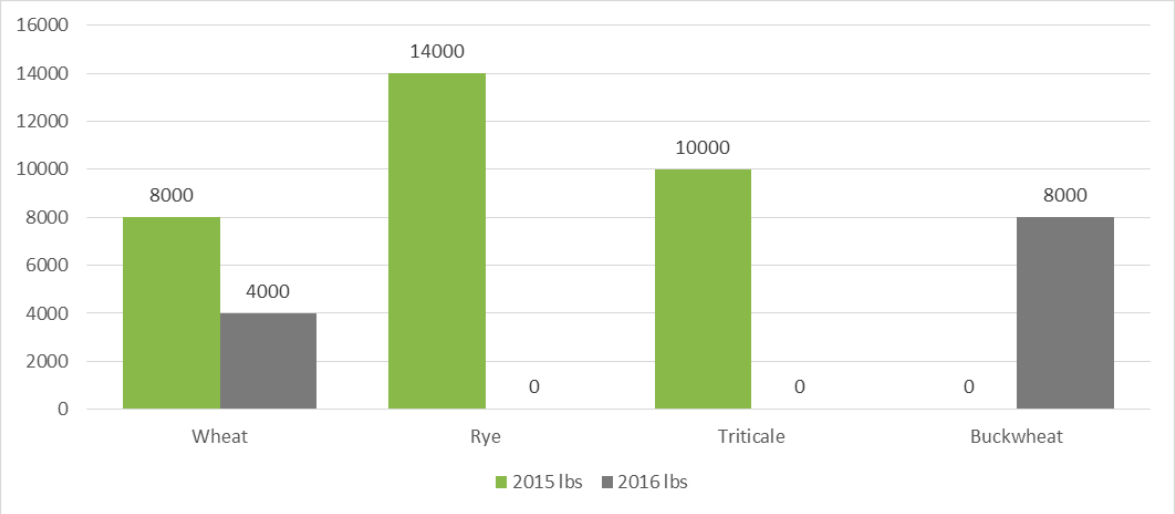
Type of Malt	Pounds	Type of Malt	Pounds
Wheat malt (n=35)	223,735	Munich (n=4)	4,800
Caramel (n=5)	114,500	Vienna (n=2)	3,000
Roasted malts (n=4)	51,204	Amber (n=1)	3,000
Crystal (n=10)	15,200	Flaked oats (n=1)	1,400
Rye malt (n=28)	11,078	Buckwheat (n=1)	1,000
Chocolate (n=4)	11,704	Maris otter (n=1)	500
Cara malt (n=3)	9,700	Black (n=1)	500
Flaked corn (n=1)	5,500	Melanoiden (n=1)	300

# MALT PRODUCTION

## MALTING OF OTHER GRAINS BY NY MALT HOUSES

New York malt houses are currently malting other grains, besides malting barley, for the brewing market. **Figure 14** shows production for 2015 and 2016.

**Figure 14. Malting of Other Grains by NY Malt Houses**

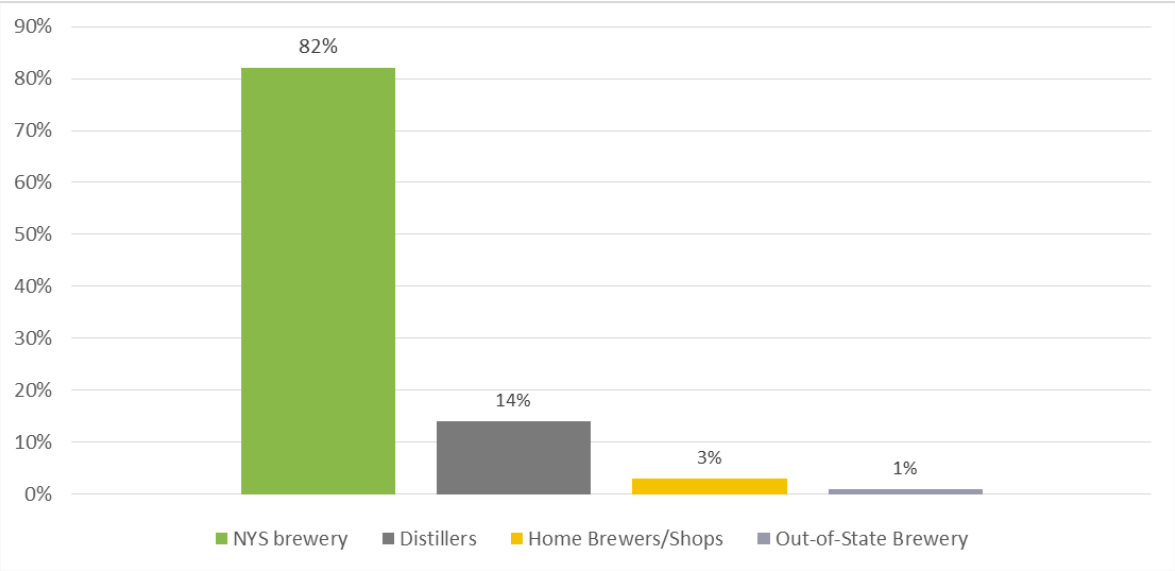


## DISTRIBUTION OF MALT ACROSS MARKETS

As illustrated in **Figure 15**, at 82% the majority of malt house sales are made to New York breweries. When asked if they prefer NY grown or out-of-state grown malting barley, all 8 responding malt houses said that they prefer to buy NY grown malting barley. Answers expressed that they are committed to supporting the legislation, NY grown products, and local markets.

When asked to identify grain quality concerns, the most common response from malt houses was DON levels and nitrogen/protein content. Less common issues identified included proper drying and separate storage on the farm.

**Figure 15. Malt House Distribution by Market**





# BREWERY RESPONSES

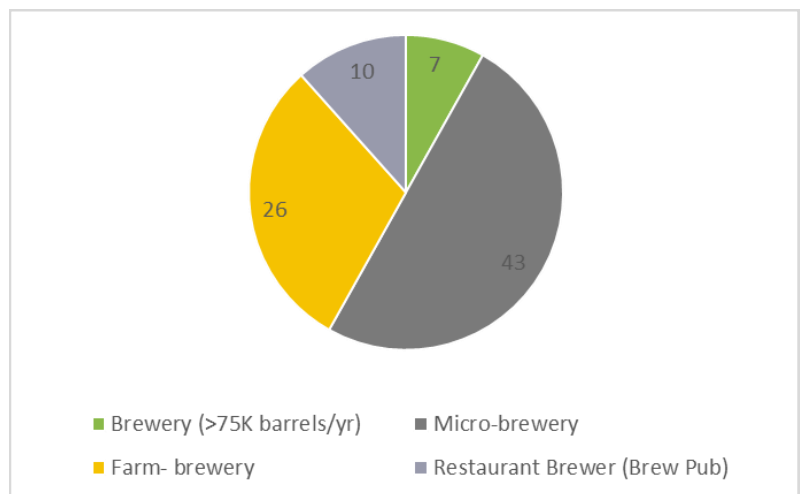
This section summarizes brewer response information from all brewery types:

- incentives associated with the Farm Brewery Law
- percentage of purchased NY vs. non-NY grown inputs
- brewers concerns with sourcing local inputs
- brewers preference for type and form of aroma and bittering hops
- price throughout the supply chain
- brewers willingness to pay a premium for NY grown inputs
- brewers perception of their customers interest in knowing the beer was brewed with local ingredients and their willingness to pay more for beer made with NY grown inputs
- whether a specialty logo would help to promote this local product

## RESPONDENTS BY BREWERY LICENSE

**Figure 16** illustrates that respondents represent all brewery license types with micro-brewery being the largest representation. There are 7 farm brewer respondents within the data that also carry another license type.

**Figure 16. Respondents by Brewery License**



A brewery produces more than 75,000 barrels of beer per year. A micro-brewery can produce up to 75,000 barrels of beer per year. A restaurant brewer, or brew pub, can operate a restaurant and may produce up to 20,000 barrels of beer per year. A farm brewery can produce up to 75,000 barrels of beer per year and is required to have a percentage of its inputs be NY grown (20% until the end of 2018, January 1, 2019 – December 31, 2023 no less than 60%, and from January 1, 2024 onward no less than 90%).

NEW YORK STATE  
**CRAFT BEER**  
*on the rise*

Growth of New York craft beer has been strong since 2013 with a **59% increase of licenses issued** between 2013 and 2015.

# BREWERY RESPONSES

## FARM BREWERY LICENSE INCENTIVES

The incentives of the Farm Brewery License provide expansion opportunities for craft brewery operations and allow them to grow while supporting local agriculture. “Ultimately, this bill is about creating jobs and strengthening our economy. Farmers that grow crops that support these breweries will benefit, as will our tourism industry that is critically important in our region.”

– Senator Ritchie

Only farm brewery licensees were asked to place a value, with the lowest being “0” and the highest being “10”, on the incentives associated with operating under a farm brewery license.

**Table 5** shows that the “Ability to sell beer by the glass” was consistently ranked with high value. The average value was 9.72 and a standard deviation of only 0.74 showing that the ranking of value was not spread out much among respondents and therefore all respondents value the incentive highly.

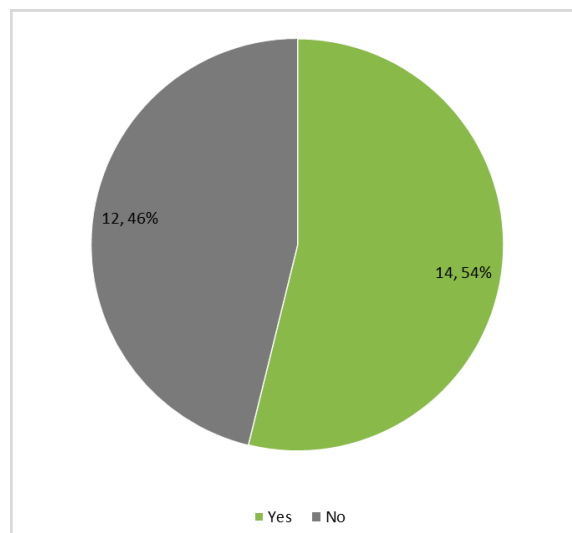
**Table 5. Farm Brewery License Incentives Ranking by Farm Brewery Licensees**

Farm Brewery License Incentives	Min Value	Max Value	Ave Value	Standard Deviation
Ability to sell beer by the glass	7.00	10.00	9.72	0.74
Exemption of excise tax reporting monthly	2.00	10.00	8.12	2.11
Ability to market as NY farm brewery produced	1.00	10.00	7.76	2.60
Ability to sell other NY farm brewery produced beer by the glass	1.00	10.00	7.56	2.81
Ability to do tastings of NY labeled beer, wine, cider, and spirits	1.00	10.00	7.50	2.93
Ability to make and sell cider by the glass	0.00	10.00	7.00	3.12
Ability to operate additional 5 branch locations	0.00	10.00	6.96	2.76
Exemption of 20C license fee	0.00	10.00	6.96	3.11
Ability to sell other NY labeled beer, wine, cider, and spirits by the bottle	1.00	10.00	6.56	3.00

**Figure 17** represents brewers response to whether or not the incentives provided to farm brewers are enough at present to justify the requirement to purchase NY grown inputs.

While over 50% said “yes, the incentives are enough” 21 out of the 26 respondents left comments. Eight comments were specific to the passing of the Craft Act and expressed concern that the incentive to sell by the glass has essentially been neutralized, yet the requirements to purchase NY inputs remain. Five comments specifically mentioned the high cost of NY ingredients. Three comments mentioned ability to source NY inputs in the quantity they need. Two noted that 20% NY grown inputs is feasible and that 60% is not given the price, quality and quantity issues. Only three brewers expressed that they are satisfied as is and are committed to buying NY grown inputs.

**Figure 17. Brewers’ Support of Current Incentives**



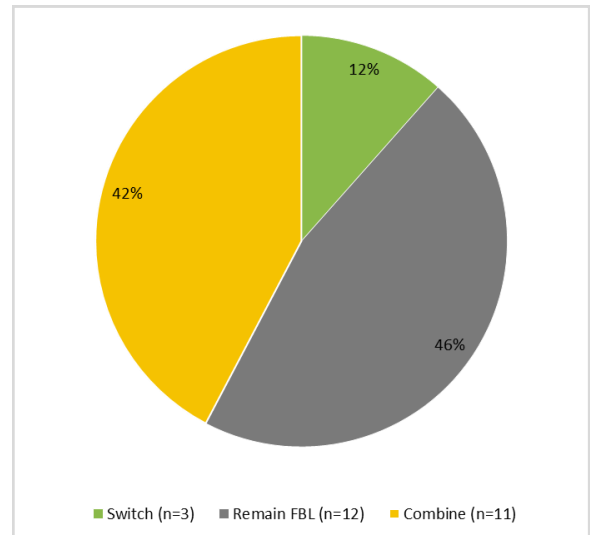
# BREWERY RESPONSES

## BREWERS' LIKELIHOOD TO ADJUST LICENSE TYPE

To follow-up we asked the brewers if additional incentives are not added to operate as a farm brewery, but the requirements to purchase NY grown inputs remain, will you switch to a different license or combine with another license.

As seen in **Figure 18**, 54% answered that they will either switch to or combine with another license. In the comments, six respondents suggested that the decision to remain a farm brewer is highly contingent on the price of NY inputs. Five noted that the availability of quality inputs would be a deciding factor and that additional incentives, such as the ability to serve NY cider and wine by the glass, to the farm brewery license would help. Although, it is important to note that overwhelmingly the farm brewers responded that they obtained the farm brewery license because of their interest and commitment to serving a locally grown beer and therefore would like to remain a farm brewer if possible.

**Figure 18. Brewers' Likelihood to Adjust License Type**



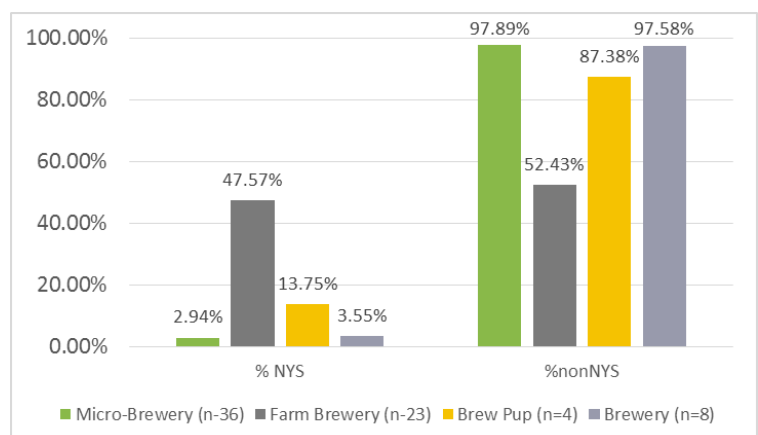
## NEWYORK vs NON-NY MALT BOUGHT BY BREWERS

While farm brewers have a requirement to purchase NY grown malt, other license holders are interested in sourcing local malt. When asked, 88% of brewers said that they already buy or plan to buy NY grown malt. **Figure 19** illustrates the percentage of local malt bought by brewers across the state broken down by license type.

Given the requirement of the Farm Brewery Law a high percentage response from the farm brewers is not unexpected. It is important to point out that the total pounds bought by those with the brewery license is significantly greater than all the other brewery types put together.

However, this is not surprising since farm brewers are just starting up and their total barrel production is still very low (some with only a 1 or 2 barrel system), while brewery licensees are producing, at a minimum, 75,000 barrels per year. So, when a brewery license decides to shift even 1% of their grain bill to local malt, it is a significant amount of malt.

**Figure 19. Percentage of NY vs Non-NY Malt Bought by Brewers in 2015**

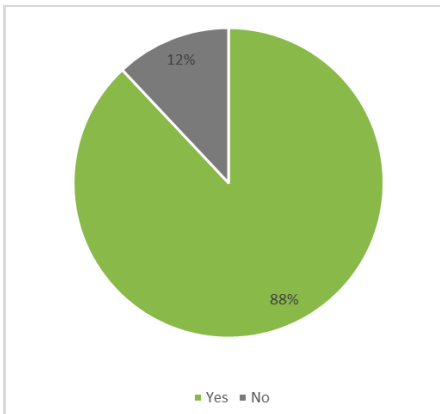


# BREWERY RESPONSES

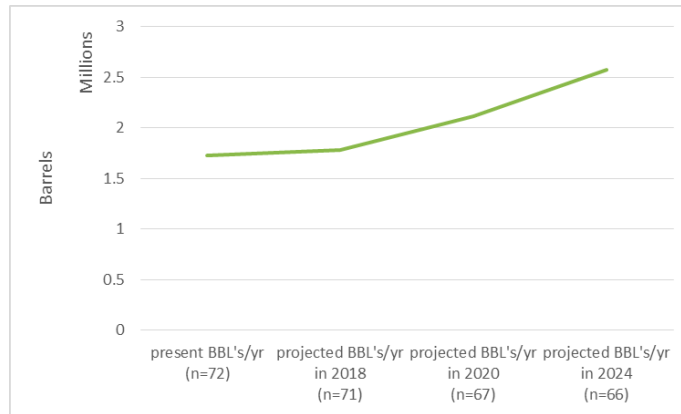
## INTENT TO PURCHASE NY GROWN MALT

When brewers were asked if they anticipate buying NY grown malt in the future, 88% responded yes, this includes both farm brewers and non-farm brewers (**Figure 20**). **Figure 21** illustrates the projected growth of barrel production of breweries in NY through 2024. Please note, the numbers provided in **Figure 21** show a trend within the industry. The numbers represent only those that responded to the survey and are not meant to be an exact representation of what the industry will need. However, it is clear from the data that production by both farm brewers and non-farm brewers is anticipated to increase significantly and the majority of these growing brewers intend to source NY grown inputs.

**Figure 20. Brewers Anticipate Buying NY Grown Malt in the Future**



**Figure 21. Barrel Production Projected Over Time**



In an effort to understand actual malting barley demand in the future, the barrel information provided in **Figure 21** was separated by license type and **Table 6** represents projected barrel production for only the farm brewers that responded to this survey. This barrel information is converted through to acres and shows that in 2018, NY will need to grow 424 acres of malting barley that meets grade in order for farm brewers to meet their 20% NY grown input requirement. On January 1, 2019 the NY grown input requirement increases to 60% so in 2020 NY will need to grow 1,649 acres of malting barley that meets grade. Finally, on January 1, 2024 the NY grown input requirement increases to 90% so in 2024 NY will need to grow 4,017 acres of malting barley that meets grade.

This acreage and barrel information is based on only those farm brewers that responded to the survey. Therefore, the numbers provided in **Table 6** underestimates the quantity of malting barley that will be needed since there are existing farm brewers that did not respond to the survey, new farm brewery licenses that continue to be issued, and other license types (that are not required to purchase NY grown inputs) who plan to source local ingredients in the future.

**Table 6. Malting Barley Acres Needed to Meet Percent of NY Grown Input Requirement for Farm Brewers Over Time with Legislatively Mandated Increases**

Year	In Barrels	Lbs in Malt (68 lbs of malt per barrel of beer)	Malt Lbs NY Grown % Increasing with Legislation	In Grain (1 lbs barley = .75 lbs malt)	Grain in Bushels (43.5 lbs of grain per bushel)	Acres by Bushel (50 bushels per acre)
2018	38,750 (N=23)	2,635,000	527,000	922,250	21,201	424
2020	50,225 (N=20)	3,415,300	2,049,180	3,586,065	82,438	1,649
2024	81,580 (N=20)	5,547,440	4,992,696	8,737,218	200,855	4,017

# BREWERY RESPONSES



## INTENT TO PURCHASE NY GROWN MALT continued

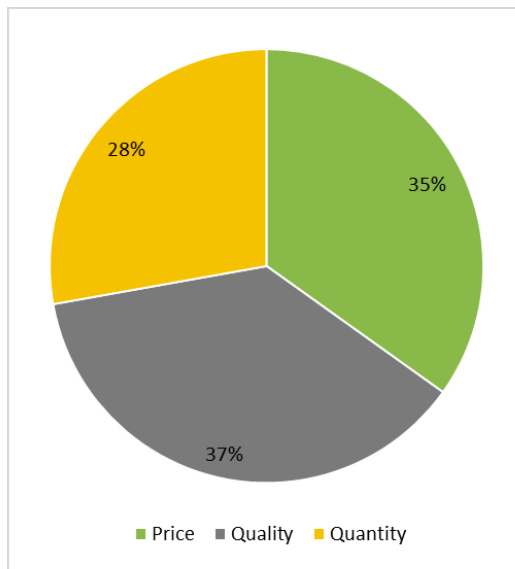
As seen in **Table 2** on page 10 there is currently enough malting barley being grown in NY to meet the needs of those brewers required to brew with NY grown inputs. However, **Figure 2** on page 6 illustrates that farmers are willing to commit 1,905 of their available 30,067 acres to growing malting barley. So, in order to meet the increasing requirements of the Farm Brewery Law and the interest in sourcing local ingredients from other license types, farmers will need to devote significantly more acreage to growing malting barley in order to meet this projected demand.

## SOURCING LOCAL MALT AND HOPS

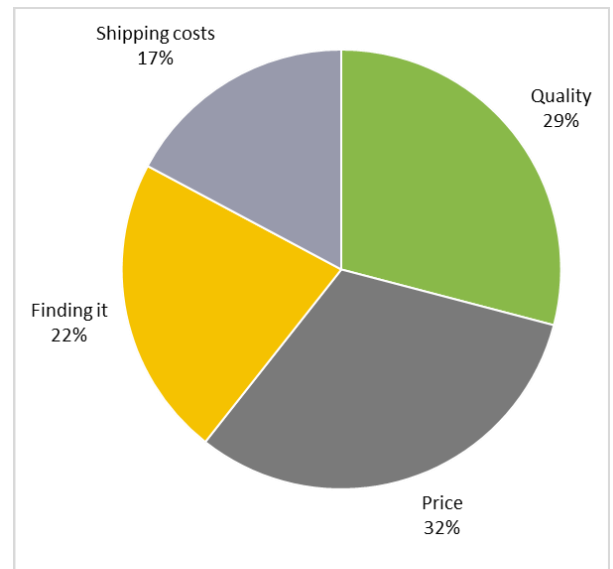
We asked brewers to rank their concern with buying NY grown malting barley. The options provided to them were: price, quality, quantity, and other. **Figure 22** illustrates that quality, price and quantity were ranked 1, 2 and 3 respectively although the concerns are closely ranked. Another significant concern was the availability of varieties and/or specialty malts, with 12 respondents providing that information in the provided “other” box.

We asked brewers to rank their concern with buying NY grown hops. The options provided to them were: price, quality, shipping costs, finding it, and other. Additional concerns listed in the provided “other” box voiced by many respondents include: varieties grown in NY (lack thereof), lack of analysis, processing and packaging concerns (both poor quality and lack thereof). **Figure 23** illustrates that price, quality, finding it and shipping costs were ranked 1, 2, 3, and 4 respectively but, as seen with malt, the concerns are closely ranked.

**Figure 22. Brewers’ Concerns with Sourcing Local Malt**



**Figure 23. Brewers’ Concerns with Sourcing Local Hops**



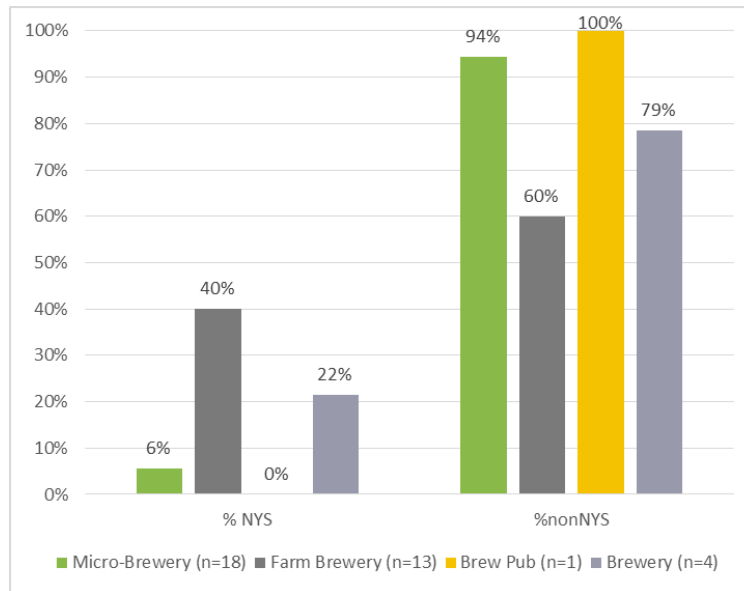
# BREWERY RESPONSES

## NEWYORK vs NON-NY HOPS BOUGHT BY BREWERS

While farm brewers have a requirement to purchase NY grown hops, other license holders are interested in sourcing local hops. When asked, 95% of brewers said that they already buy or plan to buy NY grown hops. **Figure 24** illustrates the percentage of local hops bought by brewers across the state broken down by license type.

Given the requirement of the farm brewery law a high percentage response from the farm brewer is not unexpected.

**Figure 24. Percentage of NY vs Non-NY Hops Bought by Brewers in 2015**



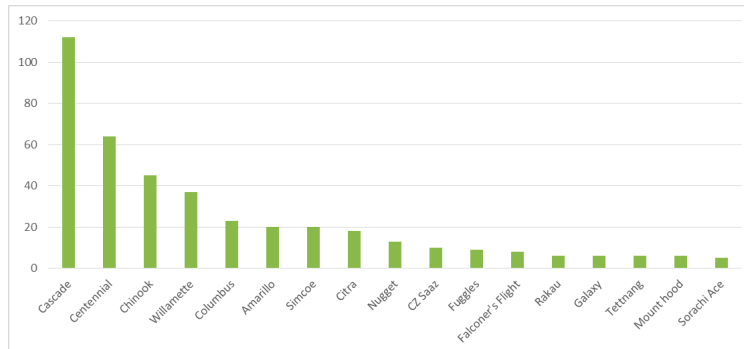
## FORM OF HOPS USED BY BREWERS

Brewers use pelletized hops 88% of the time in their beer making process followed by whole cone at 10% and wet hops making up the smallest amount at 1%.

## TOP RANKING AROMA AND BITTERING HOPS

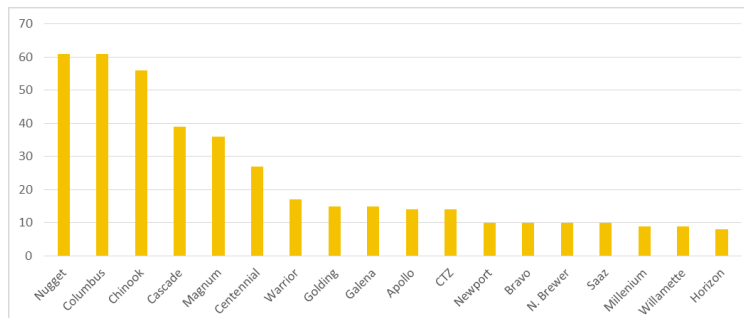
Brewers were asked to provide and rank their top six aroma hops. The results are illustrated in **Figure 25**. Cascade ranked 1st, followed by Centennial, Chinook, Willamette, and Columbus.

**Figure 25. Ranking of Aroma Hops**



Brewers were asked to provide and rank their top six bittering hops. The results are illustrated in **Figure 26**. Nugget, Columbus, and Chinook all ranked nearly the same, followed closely by Cascade, Magnum, and Centennial.

**Figure 26. Ranking of Bittering Hops**



# BREWERY RESPONSES

## PRICE OF MALTING BARLEY BY MARKET

Farmers, on average, are paid \$0.25 per pound by malt houses (both NY and out of state) for their malting barley grain. With a standard deviation of \$0.06, this price is fairly consistent across all responses. There is a slight variation in the price paid by brewers to New York malt houses and price received by New York malt houses. This may be because our response rate for brewers was 31% and with a higher response rate we may have seen consistency between the two. The prices in **Table 7** indicate the amount paid for grain plus the amount paid for freight. Some paid for the two charges separately others paid for both with one price. So for ease, the numbers are combined here. We also asked malt houses to specify where they bought their grain and all malt houses source 100% of their grain from New York farmers.

When we dug deeper into some of the numbers, we found that some farmers selling their grain for animal feed are organic and therefore received a premium for organic animal feed, noted as the maximum of \$0.23 per pound in **Table 7**. This pulled the average animal feed price up since conventional growers received \$0.10 per pound for animal feed.

Given storage and demand constraints, malt houses need to receive grain deliveries in super sacs. This requires the farmer to transfer grain from storage bins into smaller super sac containers. Additionally, brewers are not buying finished malt in large quantities which requires the malt houses to transfer malt from super sacs into smaller bags. This additional time and labor for farmers and malt houses contributes to higher prices.

**Table 7. Price of Malting Barley (per pound) by Market**

Variable	Average	Std Dev	Minimum	Maximum
<b>Farmer</b>				
NY Malthouse	0.25	0.06	0.17	0.40
Out of State Malthouse	0.25	0.08	0.17	0.33
Distillery	0.25		0.25	0.25
Animal Feed	0.16	0.05	0.1	0.23
<b>Malthouse</b>				
NY brewery Price/lb	1.00	0.06	0.9	1.1
Out-of-state brewery Price/lb	1.00	0.00	1	1
Home brewers/shops Price/lb	1.20	0.22	1	1.5
Distillery Price/lb	0.93	0.14	0.75	1.1
<b>Brewery</b>				
Out of State Malt house	0.69	0.23	0.31	1.23
NY Malt house	1.11	0.31	0.44	2.00



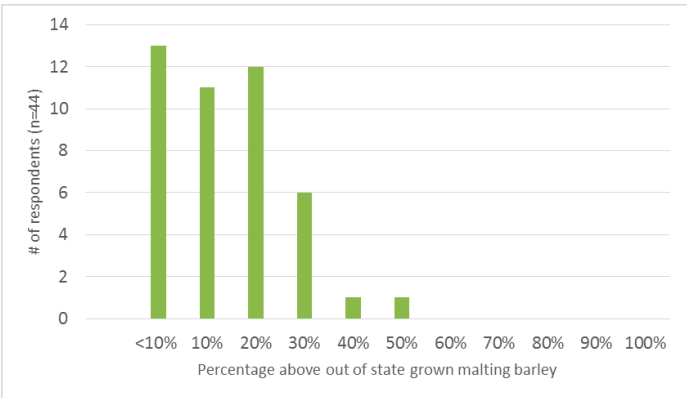
# BREWERY RESPONSES

## PREMIUM WILLING TO BE PAID FOR NY GROWN MALTING BARLEY

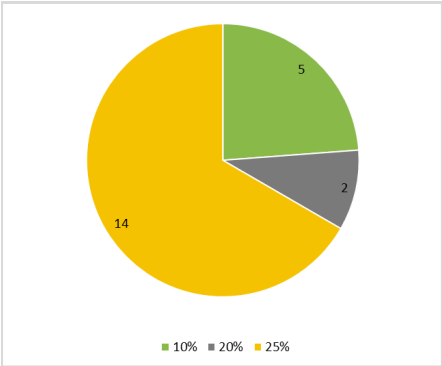
When asked what percentage above out-of-state grown malting barley prices brewers would be willing to pay, 70% of brewers responded that they would be willing to pay a premium. Their answers ranged from <10% up to 50%. The majority, at 52% fell within the 10 – 20% higher range. **Figure 27** illustrates the breakdown.

We asked brewers if they thought consumers would be willing to pay more for beer made with NY grown inputs. 21 brewers (50%) said “yes” and 21 brewers said “no.” Of those that answered “yes” we asked how much more their consumers would be willing to pay. **Figure 28** shows that 14 brewers said that their consumers would pay up to 25% more, with 5 reporting 10% more, and 2 reporting 20%.

**Figure 27. Percentage Above Out-of-State Grown Malting Barley Price Brewers are Willing to Pay for NY Grown Malting Barley**



**Figure 28. Brewers’ Perspective on How Much More Consumers Would be Willing to Pay for Beer Made with NY Grown Inputs**



## IDENTIFYING BEER PRODUCED WITH NY GROWN INPUTS

When asked, 95% of brewers indicated that their consumers would be interested in knowing which of their beers were produced with NY grown inputs. 79% of those brewers indicated that a New York designed logo specifically for NY grown brewed beer would be helpful.

Additional comments provided by the brewers emphasized the need for additional marketing of New York beer produced with NY grown inputs and associating those unique NY grown beers with a specialty logo. This would help to set farm brewers apart from other breweries and to educate the consumers on the advantages of buying New York logo labeled beer.



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### **Acknowledgements**

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NY Craft Malt

PM Farms

### **Educational purposes only**

The information contained in this publication is intended solely for the education of those interested in the brewery supply chain in New York and is not intended to provide legal, accounting, or other professional advice.

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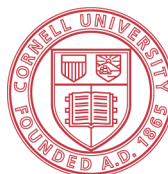
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