
Driving the New York State Hop Industry to Meet Demand

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Agenda

- **Motivation**
- **Intro to Brewing and Farming**
- **Methods**
- **Results**
- **Improvements**
- **Risks**

Motivation

- **The craft brewing industry has grown 10% from 2007 to 2012**
- **NYS had an estimated economic impact of \$3.5B from craft breweries in 2013 (Includes tourism, merchandising and supporting jobs)**
- **2015 national sales of craft beer is estimated to be \$22.3B**

Motivation

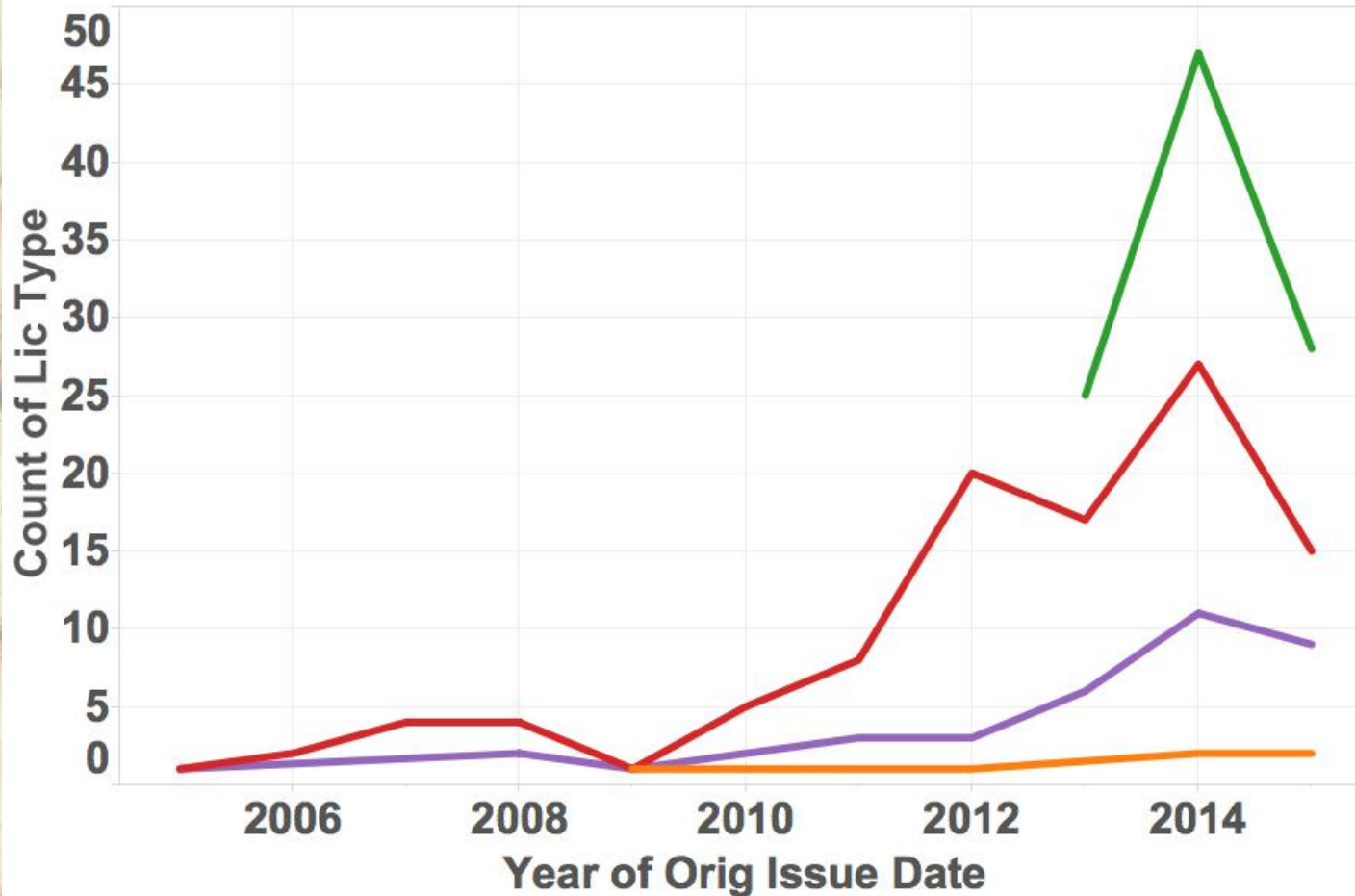
- ▣ June 15th 2012 the NYS Farm Brewery Act was passed
- ▣ Established the Farm Brewery License with the following tiered restrictions:

The Agricultural Constraints

Year	Required Dry ingredients	Required Hops
2012	20%	20%
2019	60%	60%
2024	90%	90%

Motivation

Lic Issued



Farm

Micro

Restaurant

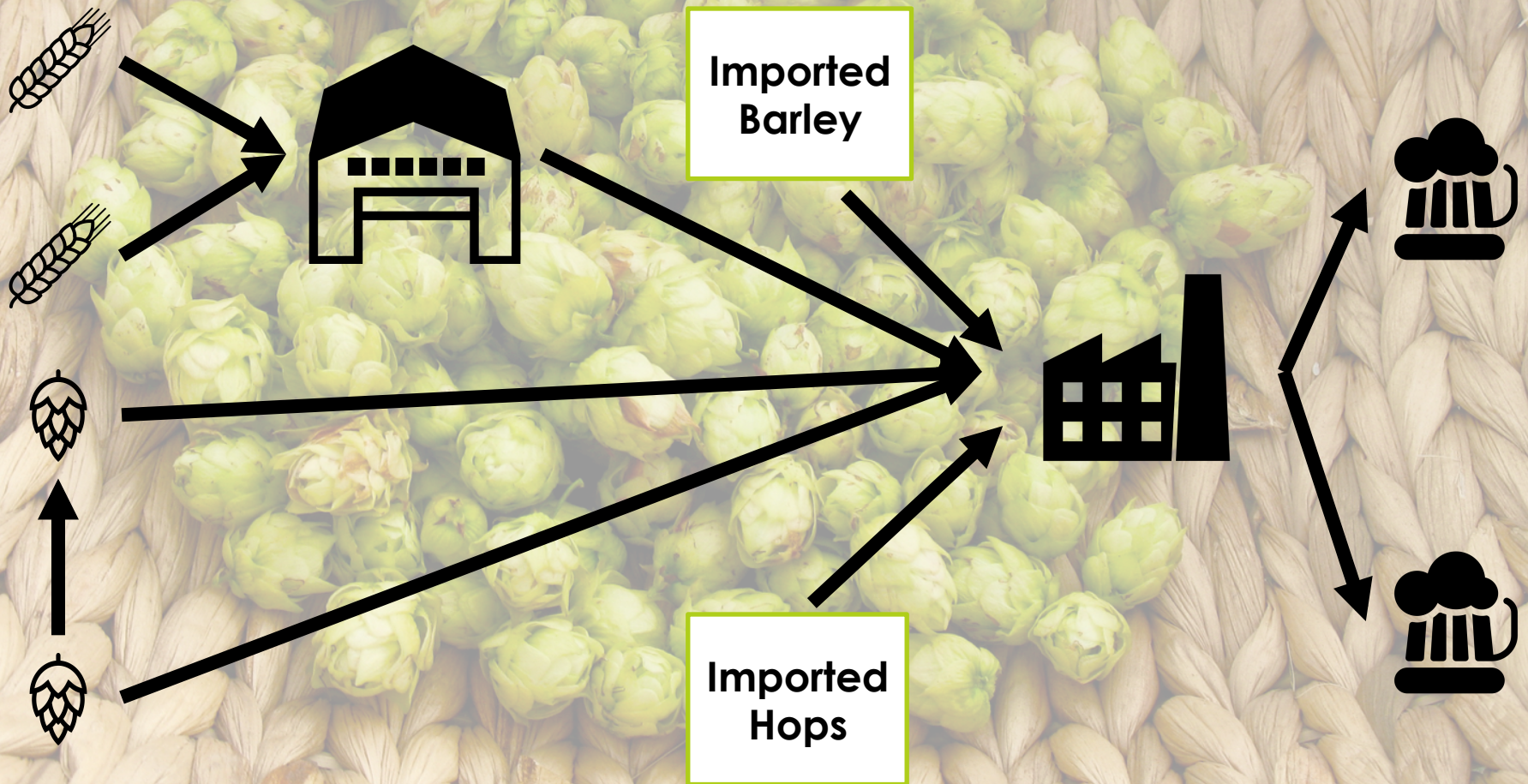
Production

Motivation

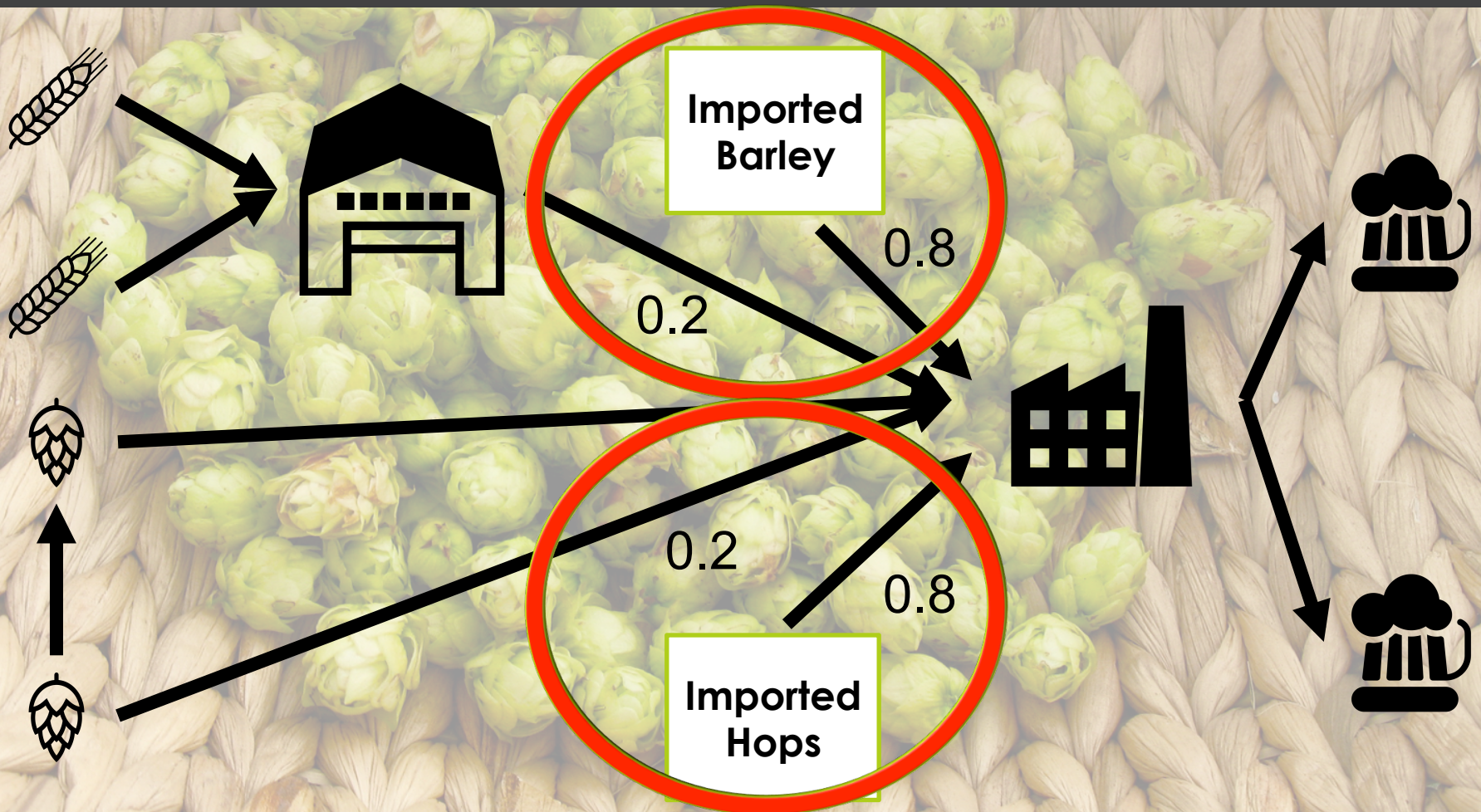
■ Research Hypothesis:

The growth of the Farm Brewing sector is occurring at a pace that will exceed the supply growth from the agricultural support sectors

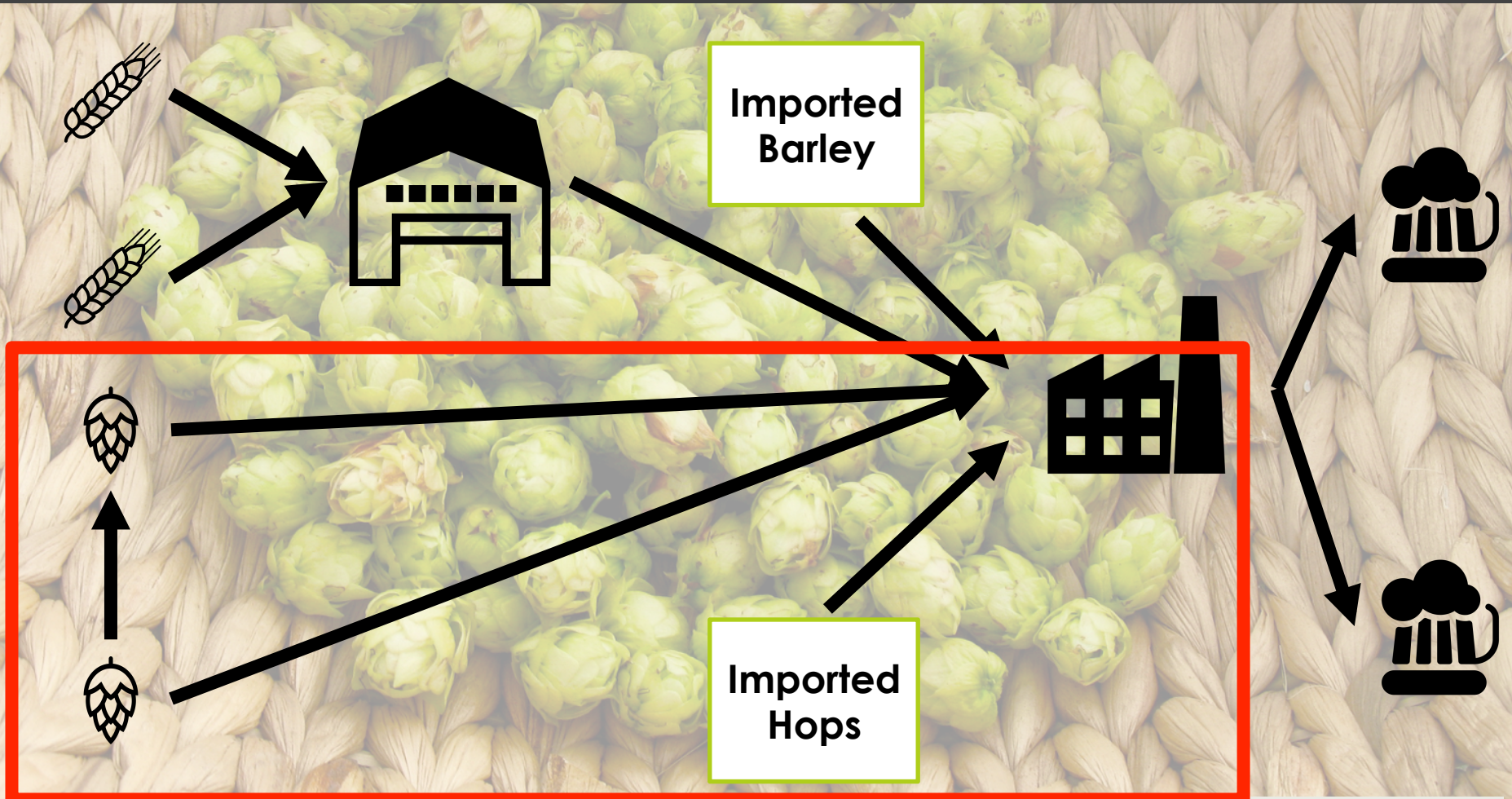
Intro to Brewing and Farming



Intro to Brewing and Farming

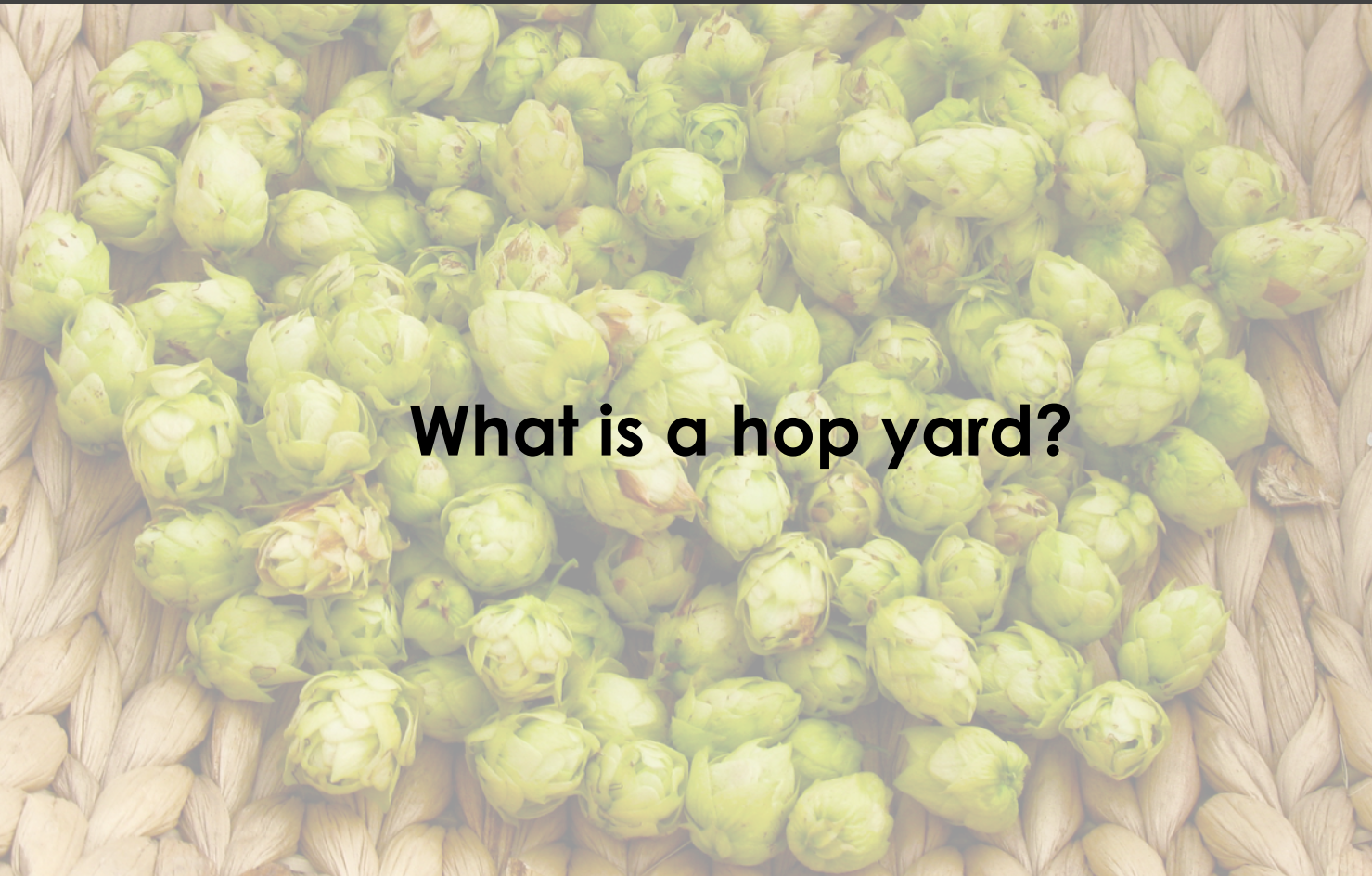


Intro to Brewing and Farming



Intro to Brewing and Farming

What is a hop yard?

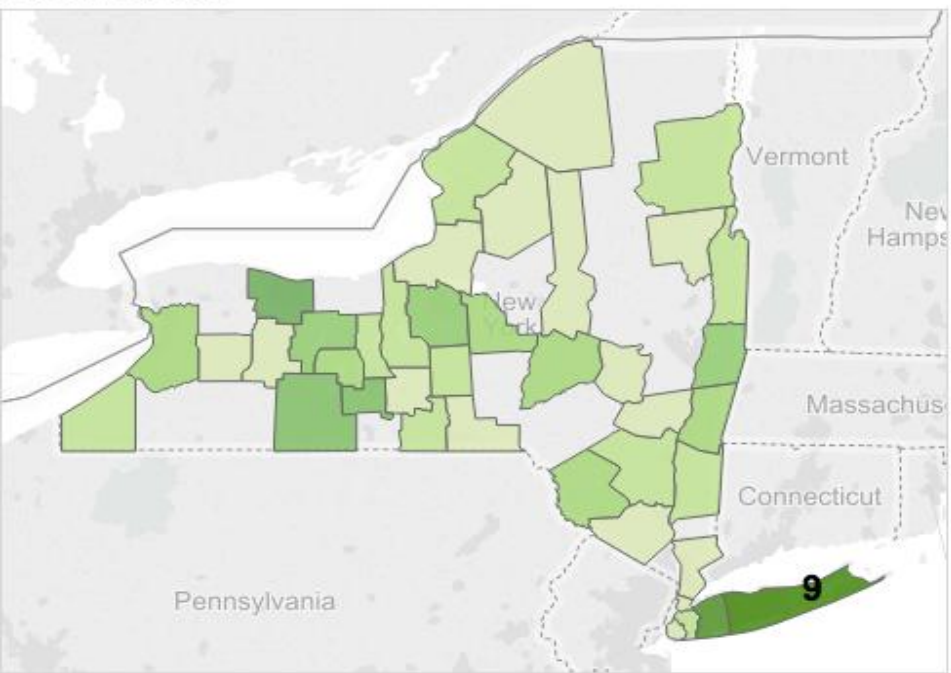




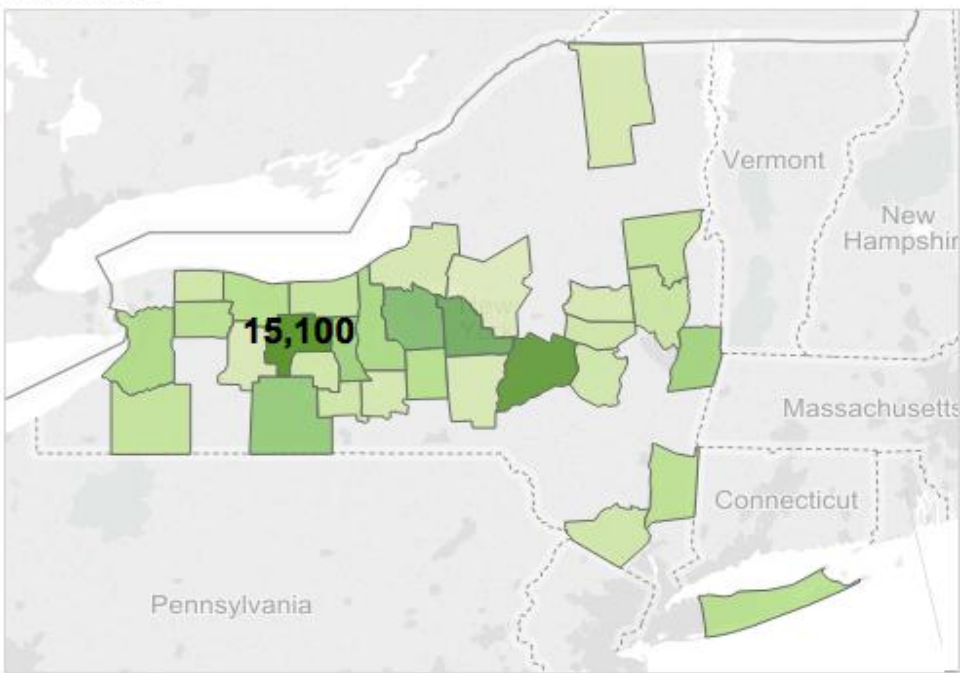
Methods

- ▣ **Visualization**
- ▣ **Hop Balance**
- ▣ **Predicting Growth**
- ▣ **Data Visualization in Tableau**

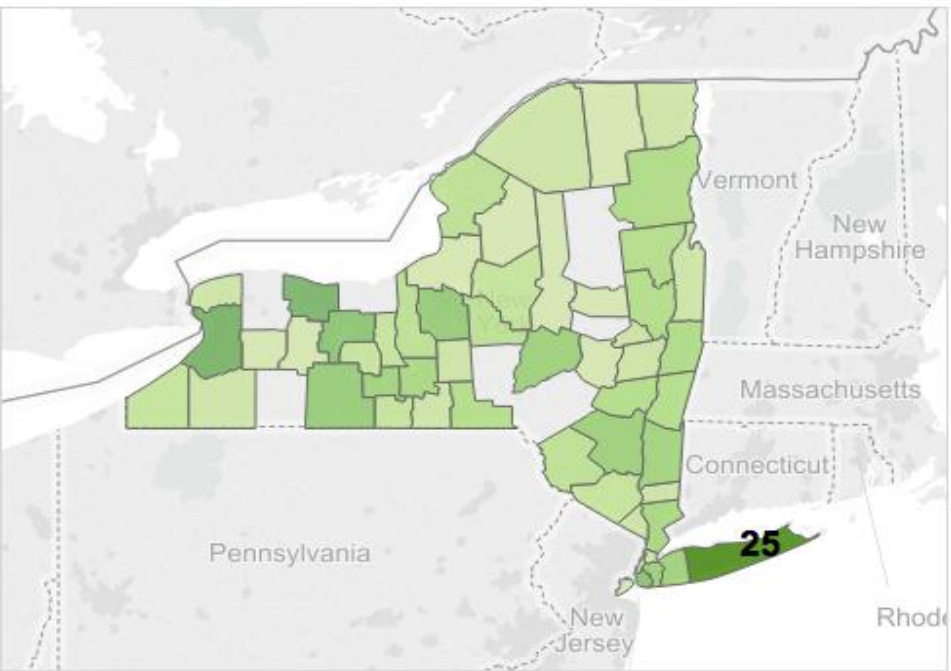
Farm Breweries



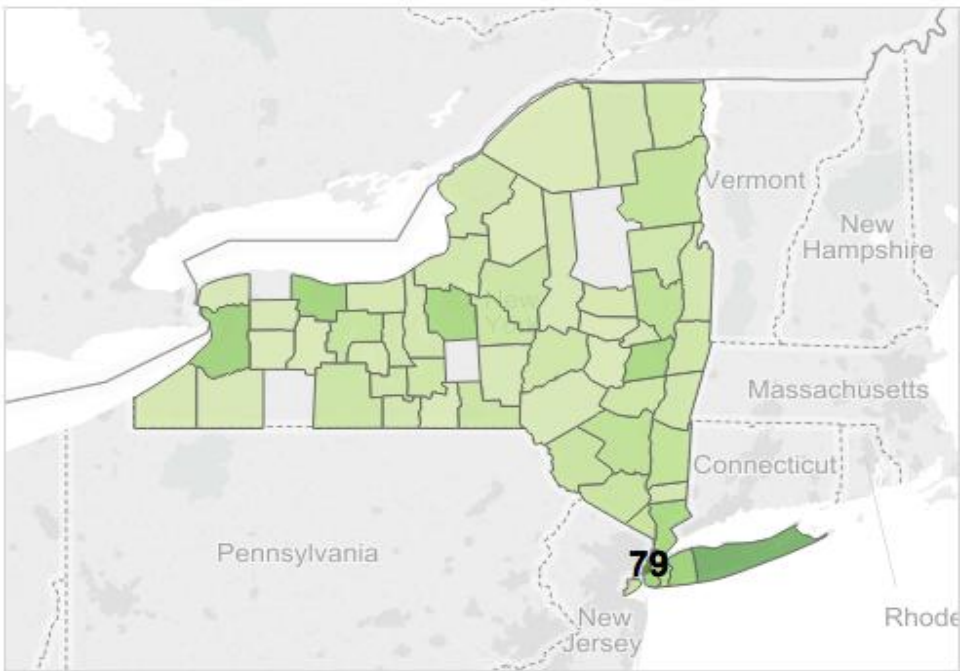
Hop Count



All Licenses



Filed Entities



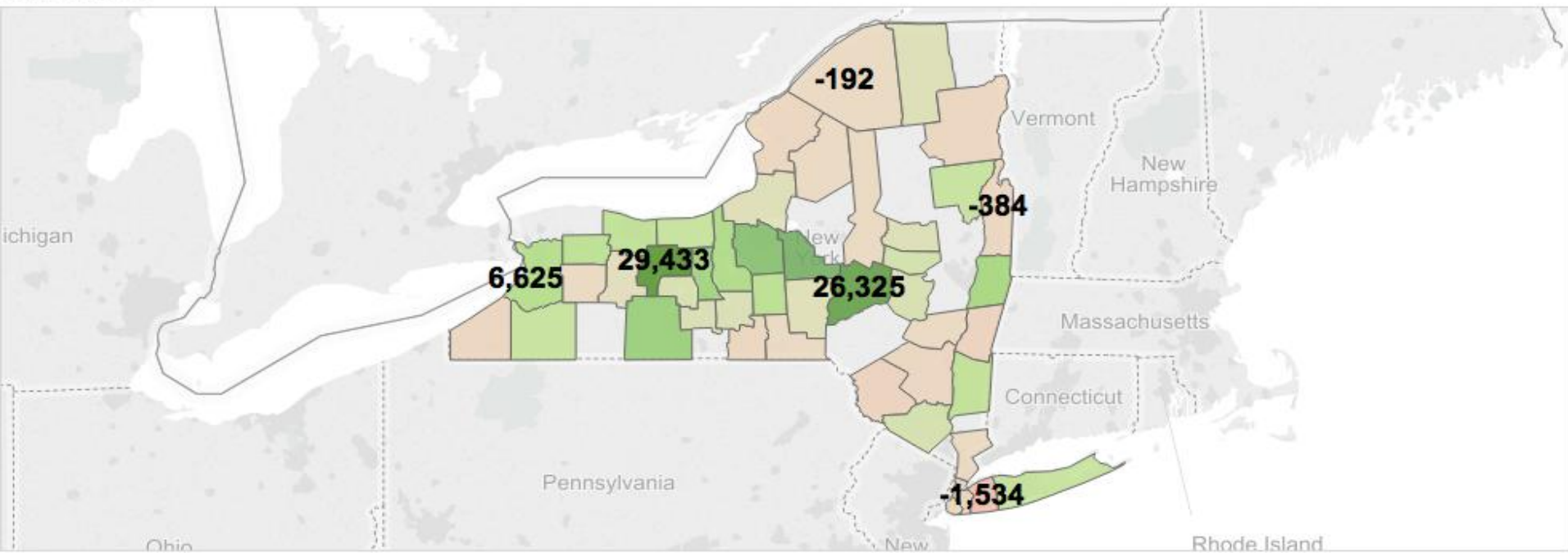
Methods: Hop Balance

Hop Balance=Hops Produced-Hops Consumed

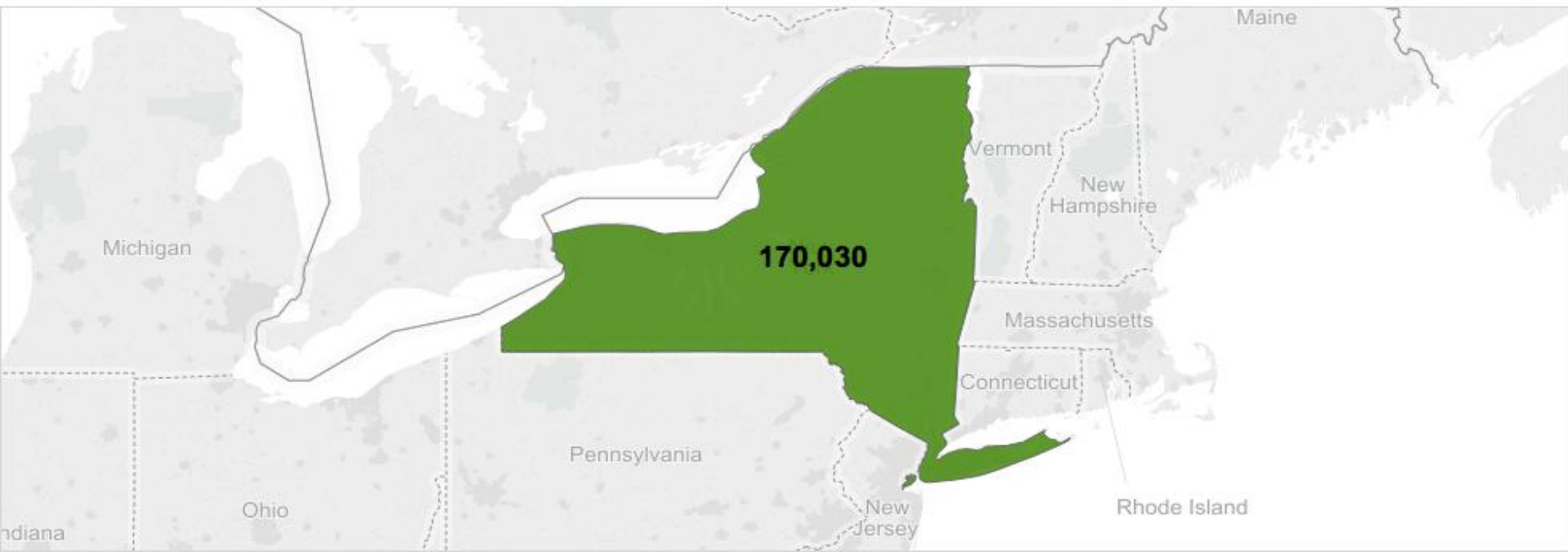
Average Farm Brewery Production Volume based on 11% of breweries reporting was 685 barrels per year with a hop usage of 1.4 pounds per barrel

Assume on Average 2 pounds of hops per mature plant

20% Balance



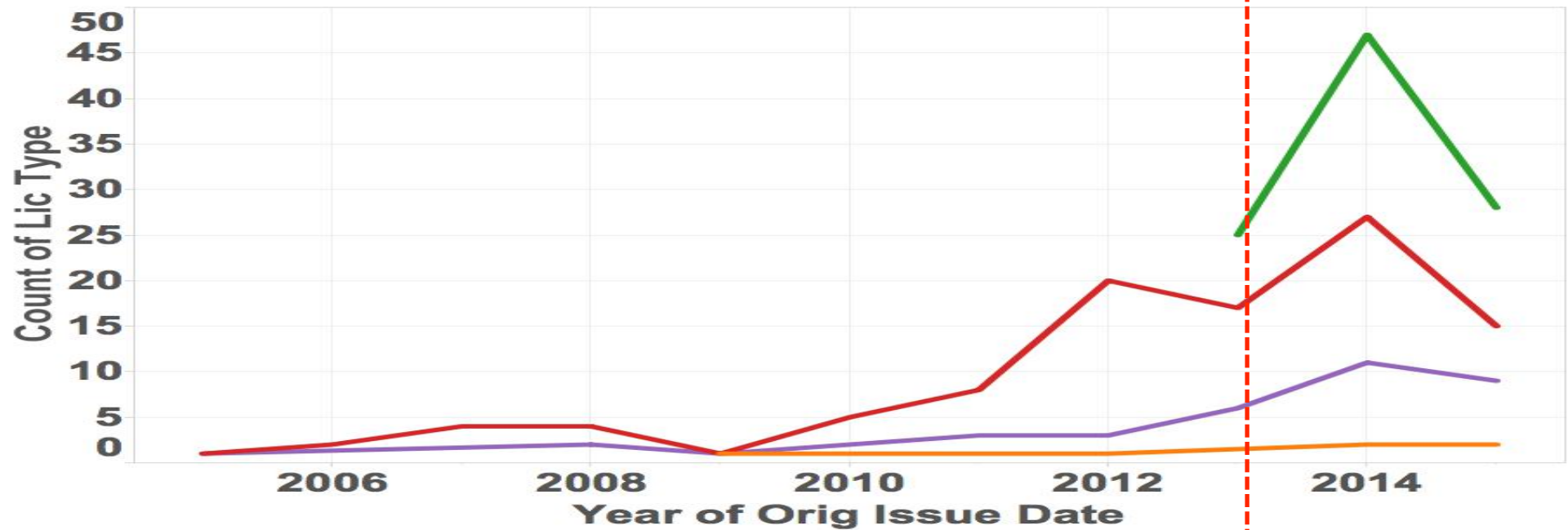
Current State Balance



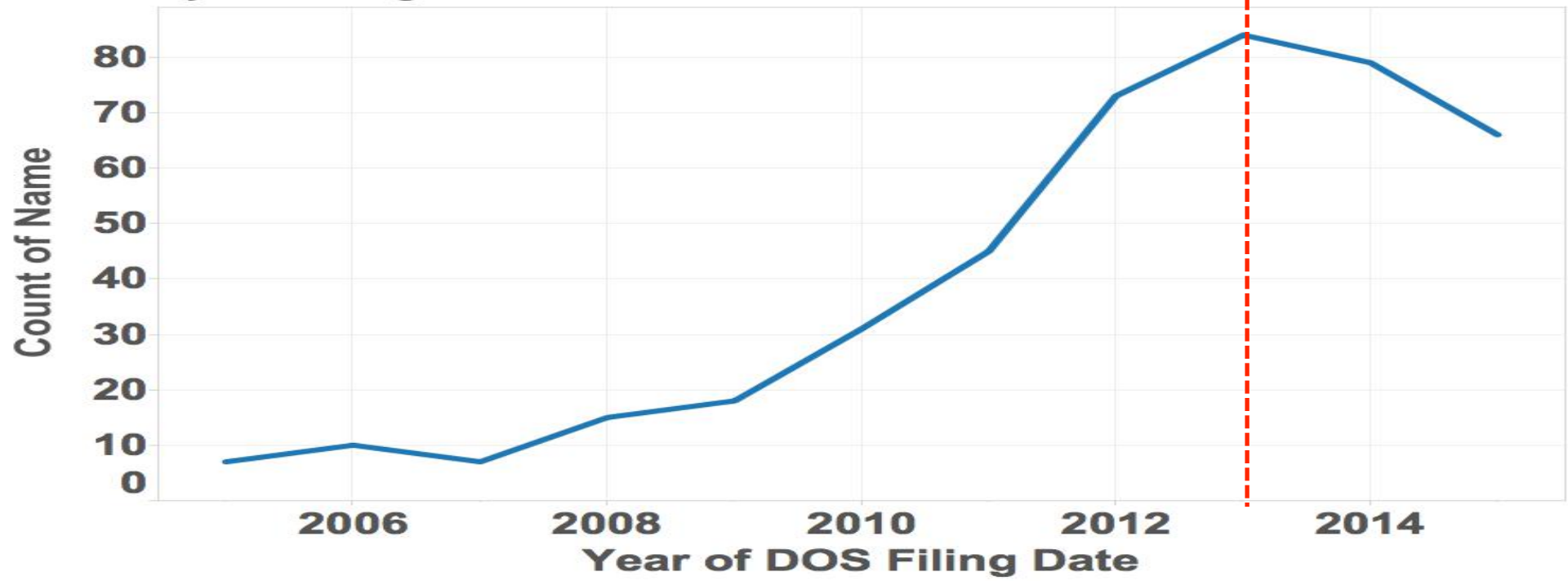
Methods: Predicting Growth

- **The state can handle a great deal of expansion within the current farm breweries productions**
- **What growth rate is likely**
 - **In the short term (<3 years)**
 - **In the long term (3-10+ years)**

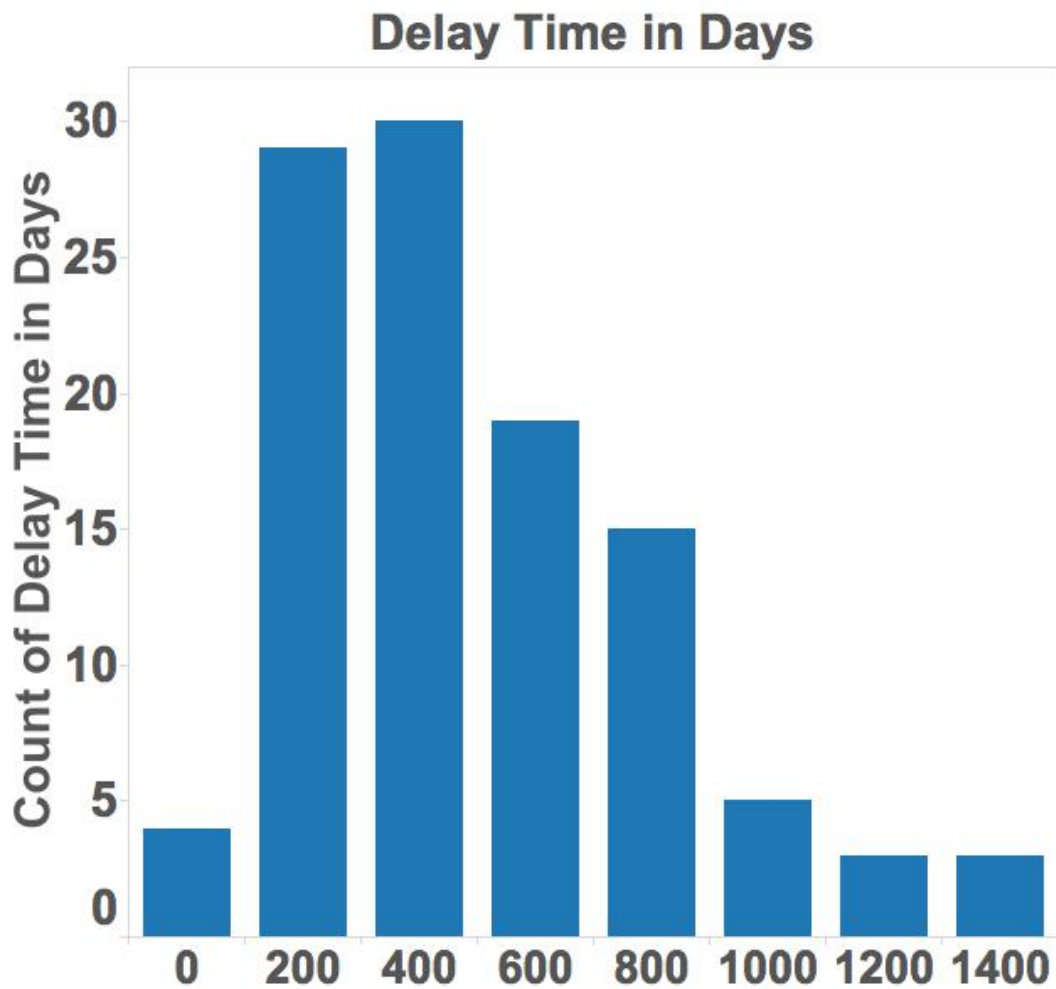
Lic Issued



"Brewery/Brewing" Entities Filed



Methods: Predicting Growth

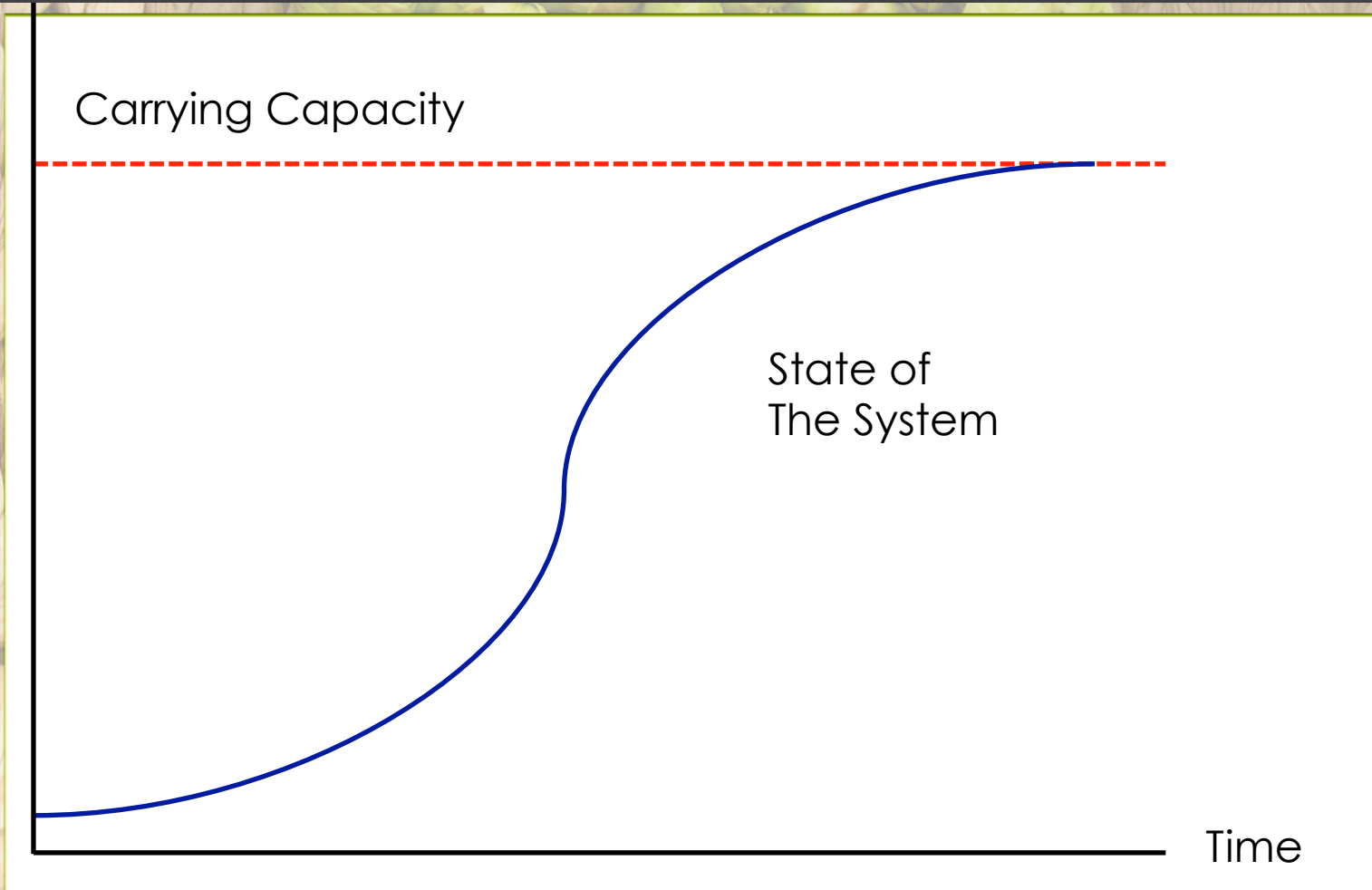


Parameter	Value
Average	589.94
Median	537.5
Strd Dev	312.03

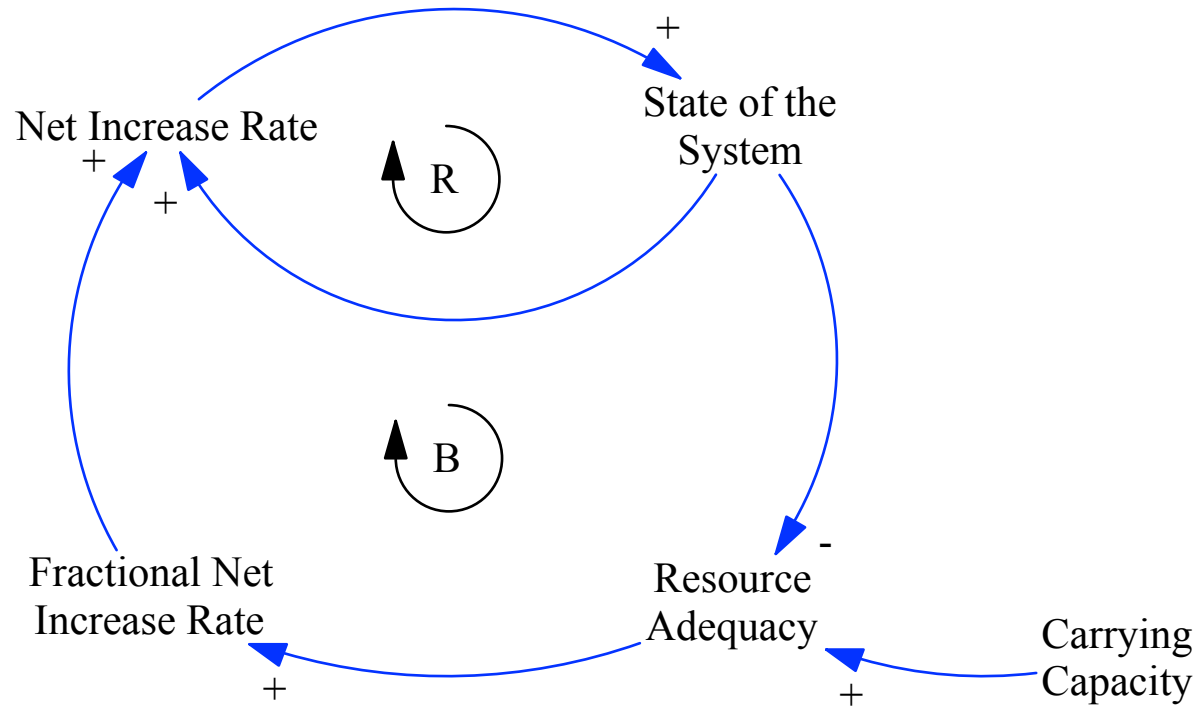
Long Term Brewery Growth

- **How to get to 2024**
- **What are possible market saturation levels**

Methods: Predicting Growth

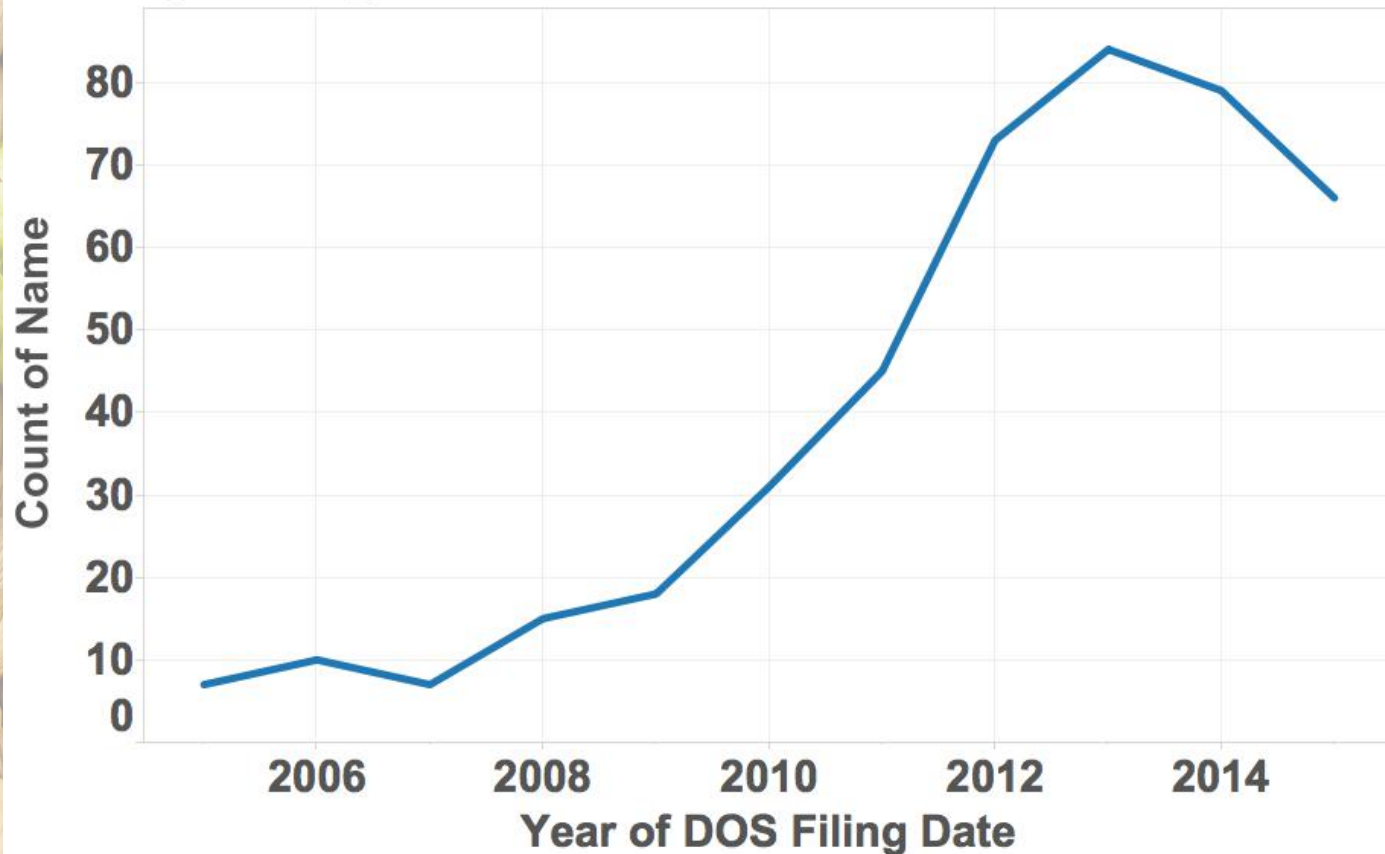


Methods: Predicting Growth

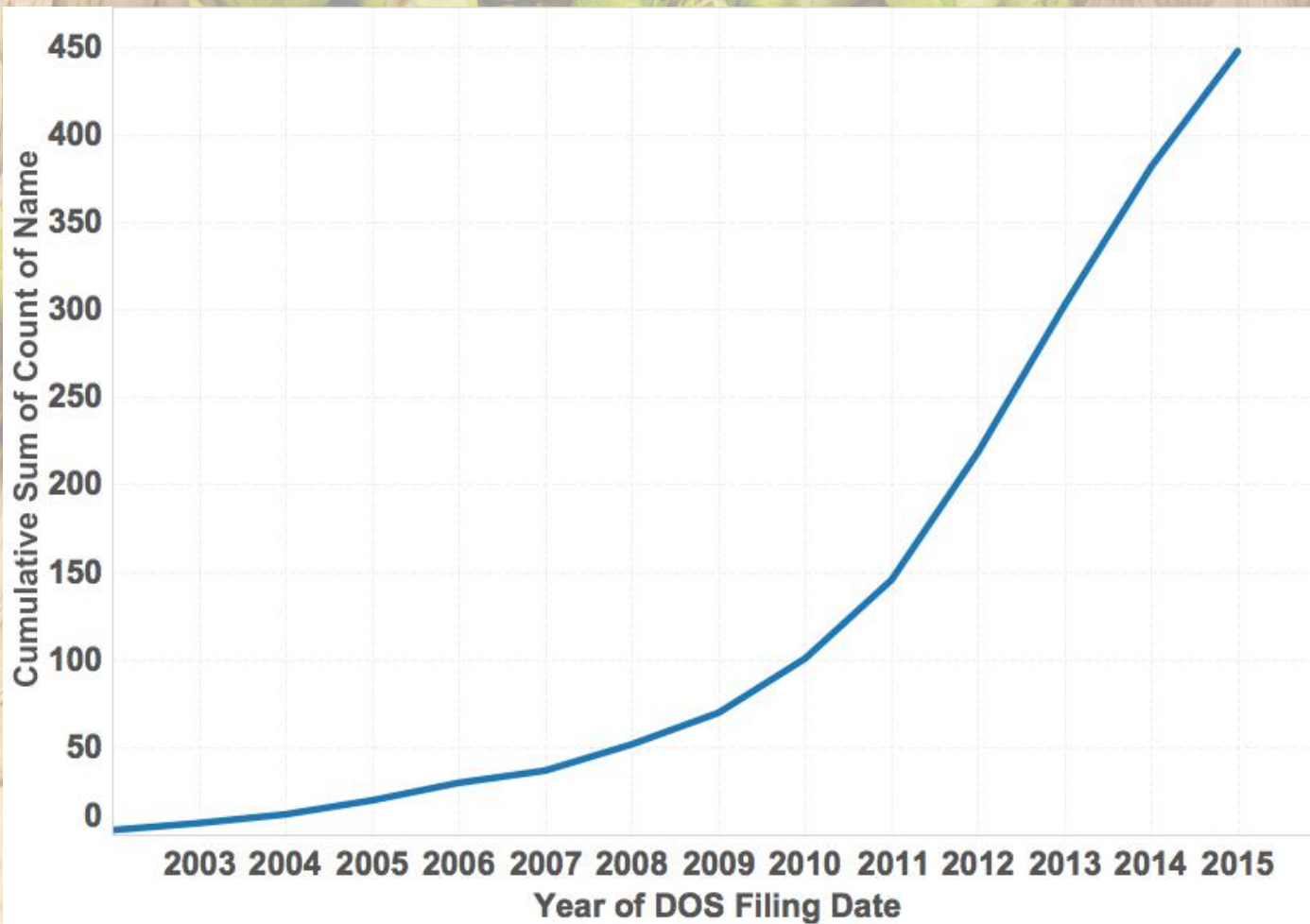


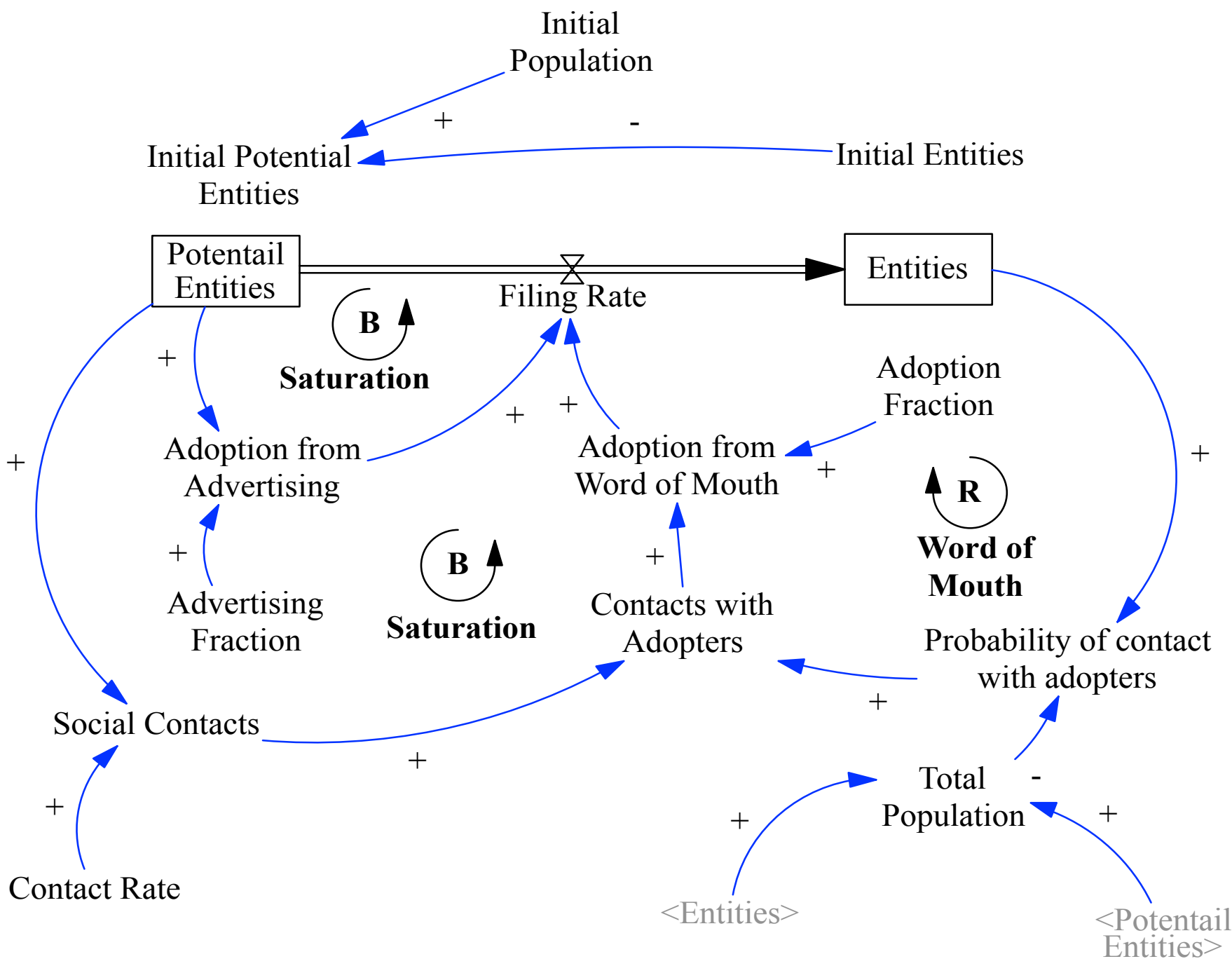
Methods: Predicting Growth

"Brewery/Brewing" Entities Filed

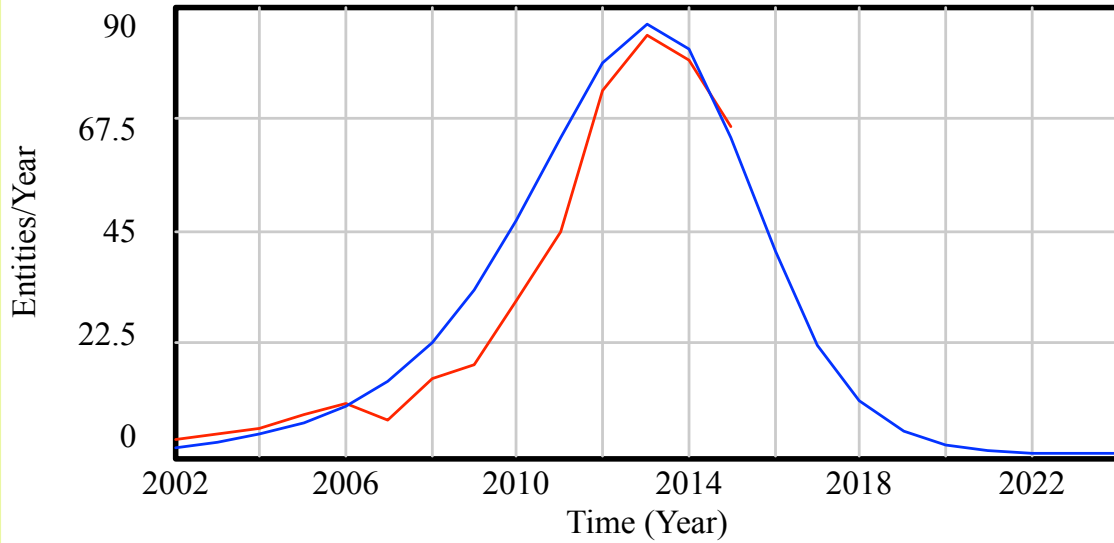


Methods: Predicting Growth





Filing Rate

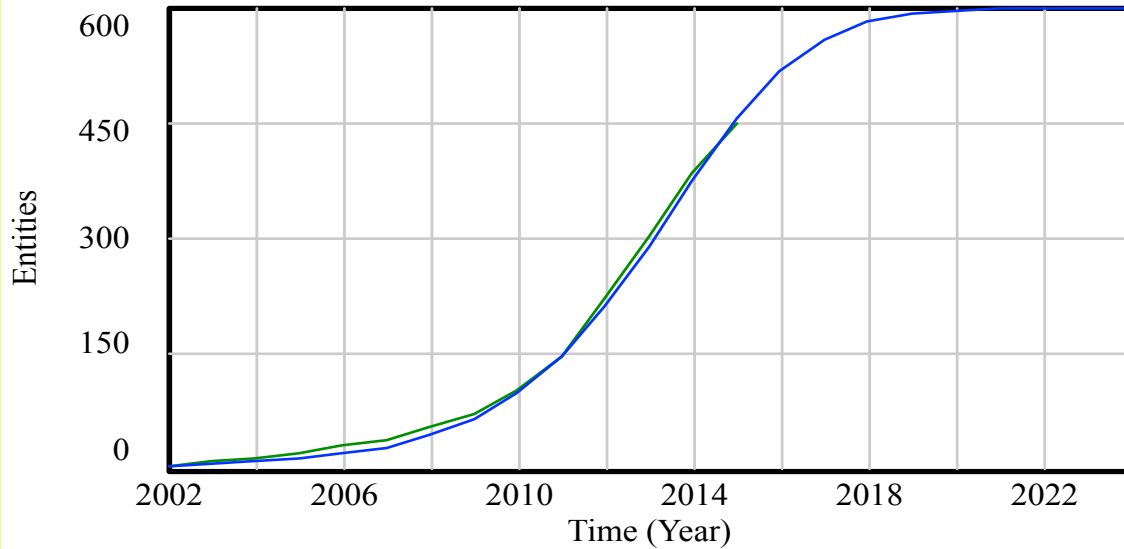


Filing Rate : Simulation ————
Filing Rate : Filing Rate ————

R^2

0.9498

Entities



Entities : Simulation ———— Entities : Entities ————

0.9985

Results

Scenario	Avg Production (barrels)	Number of Breweries	% Brewery Increase	Pounds of Hops Per Barrel	Increase from Base	State Hop Balance	Capacity Utilization
Base Line: 20% (2015)	685	99	0	1.4	0	189402	9%
3 yr growth 60% (2019)	685	265	168%	1.4	703%	55909	73%
3 yr growth 60% Max production (2019)	936	265	168%	1.4	997%	0	100%
Saturation, 60% (2022)	685	353	257%	1.4	970%	5274	97%
Saturation, 90% (2024)	685	353	257%	1.4	1505%	-96284	146%
Extreme Scenario (2024)	1000	353	257%	1.55	2493%	-284045	236%

Key Assumptions

- All farmers reach their stated potential
- Quality of the hops
- Farmers only sell to Farm Breweries
- Efficient Distribution

Improvements- Clustering

- Shared resources for harvesting
 - Direct exchange of tacit knowledge
 - Shared financial burden
 - IRR of 1/4 acre is great (66%) but once you need to scale up, the investment is enormous. Break Even (NPV=0) is 2.6 Acres, 4 Acres to begin to make a living
- Quality improvement through best practices
- Cooperative economies of scale
- Storage and distribution flexibility

Risks

- **Varietal Limitations**
- **Proprietary Hops**
- **Growth of Brewery Scale**
- **Craft NY Act of 2014**

Future Work

- **Comparison of state wide growth in brewing industries among other states adopting a farm brewer license class**
 - **NJ, MD, MA, VT**
- **Look at the commercial implications of the law's full 90% requirement when it become prohibitive to use proprietary ingredients**
- **Go back over the DOS filing data and License issue data and collect the next 6 months to validate growth models**
- **Development of a market platform for the industry**
- **Expansion of the Bass Diffusion Model to evaluate levers the Farm Brewery Act created**

Takeaways

- The state is in a good position from the hop perspective
- There needs to be integrative supply chain improvements
- A collaborative market place should be pursued
 - Auction/Broker/E-Bay Style
- Further sophisticated tracking of the hop industry needs to be established
- Hop farmers need to anticipate reduced retail prices in the near future

Questions?

