



# Hops: Marketing and Cost of Production

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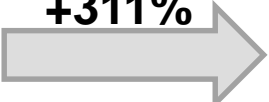
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# Overview

- Craft industry
- Breweries survey results
- Cost of production
- Marketing and market opportunities

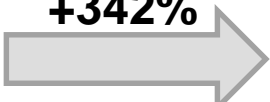
# Growth in the Craft Brewing Industry from 2011 to 2017

## United States

2,047  +311% 6,372

vs.

## Tennessee

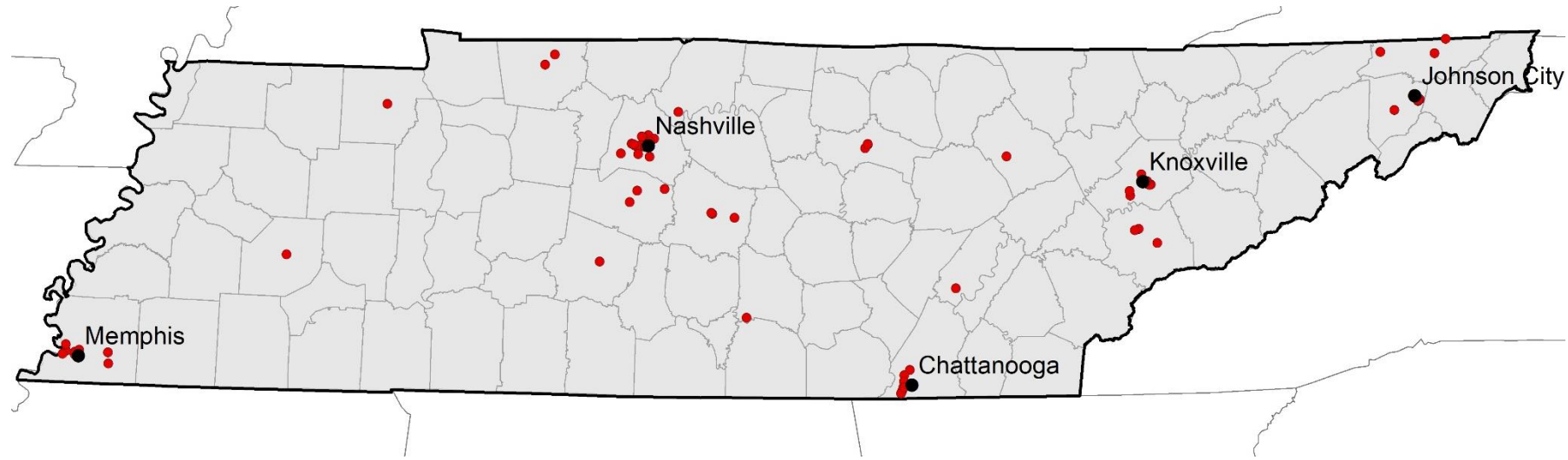
24  +342% 82

### Craft brewery is defined as:

“Annual production of 6 million barrels of beer or less (approximately 3 percent of U.S. annual sales). Less than 25 percent of the craft brewery is owned or controlled (or equivalent economic interest) by a beverage alcohol industry member that is not itself a craft brewer.”

Source: Brewers Association

# Location of Craft Breweries in Tennessee



- 104 physical locations – several breweries have multiple locations
- Surveys were distributed to 72 breweries (removing those that were not in production, did not have contact information or were bringing beer from outside the state)
- 34 responses were recorded; response rate of 47%

# Tennessee by City

## List of Breweries in

	A	B	D	E	F	G	H
1	Company	Website	Street Address	City	St	Zip Code	Phone Number
4	Asgard Brewing Company	<a href="http://www.asgardbrewery.com">www.asgardbrewery.com</a>	104 E 5th St.	Columbia	TN	38401-3351	(615) 669-9908
6	Bearded Iris Brewing	<a href="http://www.beardedirisbrewing.com">www.beardedirisbrewing.com</a>	101 Van Buren St.	Nashville	TN	37208-1719	(615) 928-7988
12	Blackstone Brewing Co	<a href="http://www.blackstonebrewery.com">www.blackstonebrewery.com</a>	2312 Clifton Ave	Nashville	TN	37209-4115	(615) 320-9002
20	Cool Springs Brewery	<a href="http://www.coolspringsbrewery.com">www.coolspringsbrewery.com</a>	600A Frazier Dr. Ste 135	Franklin	TN	37067-4677	(615) 503-9626
21	Corsair Artisan LLC	<a href="http://www.corsairartisan.com/">http://www.corsairartisan.com/</a>	1200 Clinton St Ste 110	Nashville	TN	37203-2894	(615)-200-0320
24	Czann's Brewing	<a href="http://www.czanns.com">www.czanns.com</a>	505 Lea Avenue	Nashville	TN	37203-4499	(615) 748-1399
27	East Nashville Beer Works	<a href="http://www.eastnashbeerworks.com">www.eastnashbeerworks.com</a>	320 E Trinity Ln	Nashville	TN	37207-4524	(615) 891-3108
31	Fat Bottom Brewing	<a href="http://www.fatbottombrewing.com">www.fatbottombrewing.com</a>	800 44th Ave N	Nashville	TN	37209-2336	615.678.5895
32	Garr's Beer Co.	<a href="http://www.garrs.beer">www.garrs.beer</a>	4112 Owen Watkins Ct.	Franklin	TN	37067	(615) 509-0009
36	Granite City Food & Brewery		1864 W McEwen Dr	Franklin	TN	37067-1782	
38	Green Dragon Pub and Brewery	<a href="http://www.facebook.com/pg/greendragonpub/">www.facebook.com/pg/greendragonpub/</a>	714 F West Main St	Murfreesboro	TN	37129	(615) 801-7171
40	Hap and Harry's	<a href="http://www.hapandharrys.com/h">http://www.hapandharrys.com/h</a>	411 Great Circle Road	Nashville	TN	37228	(877) 590-2026
45	Hollow Pointe Brewery	<a href="https://www.hollowpointebrewery.com/">https://www.hollowpointebrewery.com/</a>		Nashville	TN		
47	Honky Tonk Brewing Co	<a href="http://www.honkytonkbeer.com">www.honkytonkbeer.com</a>	240 Cumberland Bnd	Nashville	TN	37228-1804	(615) 742-9770
50	Jackalope Brewing Company, LLC	<a href="http://www.jackalopebrew.com">www.jackalopebrew.com</a>	701 8th Ave S	Nashville	TN	37203-4104	(615) 873-4313
54	Jubilee Craft Beer Co	<a href="http://www.jubileebeer.com">www.jubileebeer.com</a>	3430 Hampton Ave	Nashville	TN	37215-1408	(615) 686-9397
58	Little Harpath Brewing Co	<a href="http://www.littleharpathbrewing.com">www.littleharpathbrewing.com</a>	30 Oldham St	Nashville	TN	37213-1107	(505) 573-7187
60	Mantra Artisan Ales	<a href="http://www.mantrabrewing.com">www.mantrabrewing.com</a>	216 Noah Dr Ste 140	Franklin	TN	37064-4024	(615) 628-8776
61	Mayday Brewery	<a href="http://www.maydaybrewery.com">www.maydaybrewery.com</a>	521 Old Salem Rd Ste C	Murfreesboro	TN	37129-5305	(615) 479-9722
68	Music City Beer Co	<a href="http://musiccitybeerco.com">http://musiccitybeerco.com</a>		Nashville	TN		
69	New Heights Brewing Company	<a href="http://www.newheightsbrewing.com">www.newheightsbrewing.com</a>	928 5th Avenue S	Nashville	TN	37203-4612	(615) 490-6901
71	Ole Shed Brewing Company		516 E Carroll St	Tullahoma	TN	37388-3983	(931) 422-8820
77	Rock Bottom Brewey - Nashville	<a href="http://www.bigrivergrille.com/">http://www.bigrivergrille.com/</a>	111 Broadway	Nashville	TN	37201-2117	(615) 251-4677
82	Smith & Lentz Brewing	<a href="http://www.smithandlentz.com">www.smithandlentz.com</a>	903 Main St	Nashville	TN	37206-3609	615-436-2195
87	Southern Grist Brewing Company #1	<a href="http://www.southerngristbrewing.com">www.southerngristbrewing.com</a>	1201 Porter Rd	Nashville	TN	37206-1733	(629) 203-7159
88	Southern Grist Brewing Company #2	<a href="http://www.southerngristbrewing.com">www.southerngristbrewing.com</a>	5012 Centennial Blvd.	Nashville	TN	37209	(615) 864-7133
89	Steel Barrel Brewing	<a href="http://www.steelbarrelbrewing.com">www.steelbarrelbrewing.com</a>	6790 John Bragg Hwy	Murfreesboro	TN	37127	
91	Tailgate Brewery	<a href="http://www.tailgatebeer.com">www.tailgatebeer.com</a>	7300 Charlotte Pike	Nashville	TN	37209-5012	(615) 861- 9842
92	Tailgate Brewery - Music Row	<a href="http://www.tailgatebeer.com">www.tailgatebeer.com</a>	1538 Demonbreun St	Nashville	TN	37203-3112	(629) 702- 5914
93	Tennessee Brew Works	<a href="http://www.tnbrew.com">www.tnbrew.com</a>	809 Ewing Ave	Nashville	TN	37203-4631	(615) 436-0050
95	The Black Abbey Brewing Co.	<a href="http://www.blackabbeybrewing.com">www.blackabbeybrewing.com</a>	2952 Sidco Dr.	Nashville	TN	37204-3710	(615) 755-0070
99	Turtle Anarchy Brewing Co	<a href="http://www.turtleanarchy.com">www.turtleanarchy.com</a>	5901 California Ave Ste 105	Nashville	TN	37209-1370	(615) 595-8855
103	Yazoo Brewing Co	<a href="http://www.yazooobrew.com">www.yazooobrew.com</a>	910 Division St	Nashville	TN	37203-4111	(615) 891-4649

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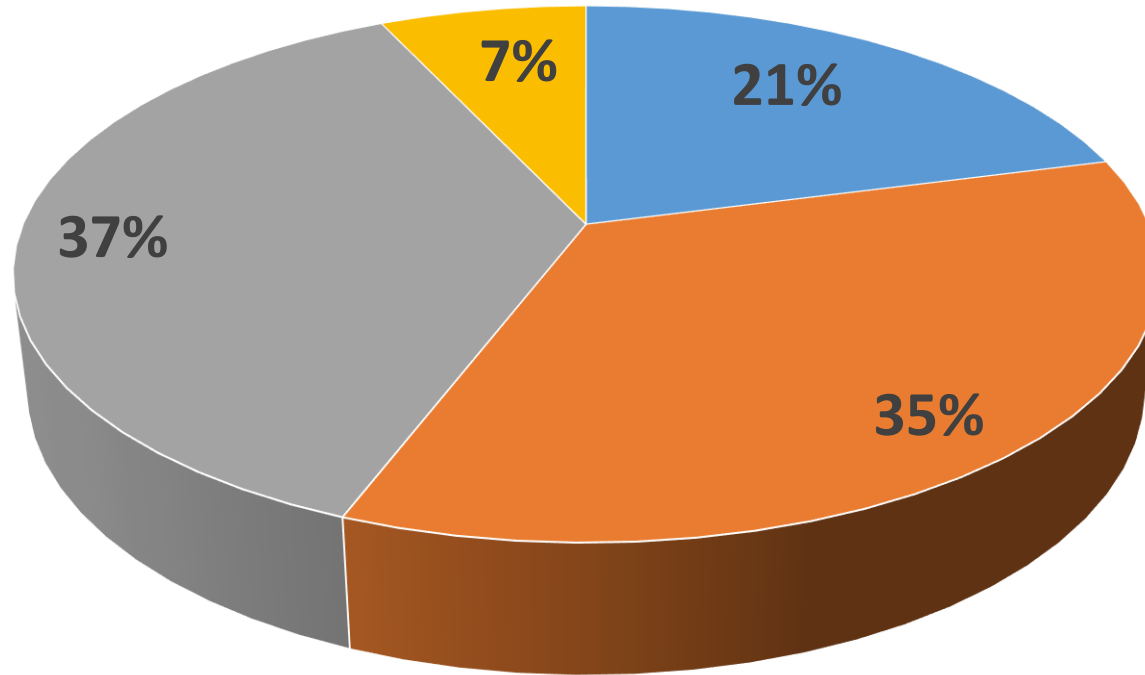
Demand for hops by craft brewers in Tennessee

# SURVEY RESULTS

# 2018 Craft Brewery Survey

- 31 questions on input use, spent grain disposal, and brewery characteristics
  - The size of the craft industry
  - Demand for hops and other inputs
  - Marketing and value added opportunities

# Brewery Business Descriptions, n= 43

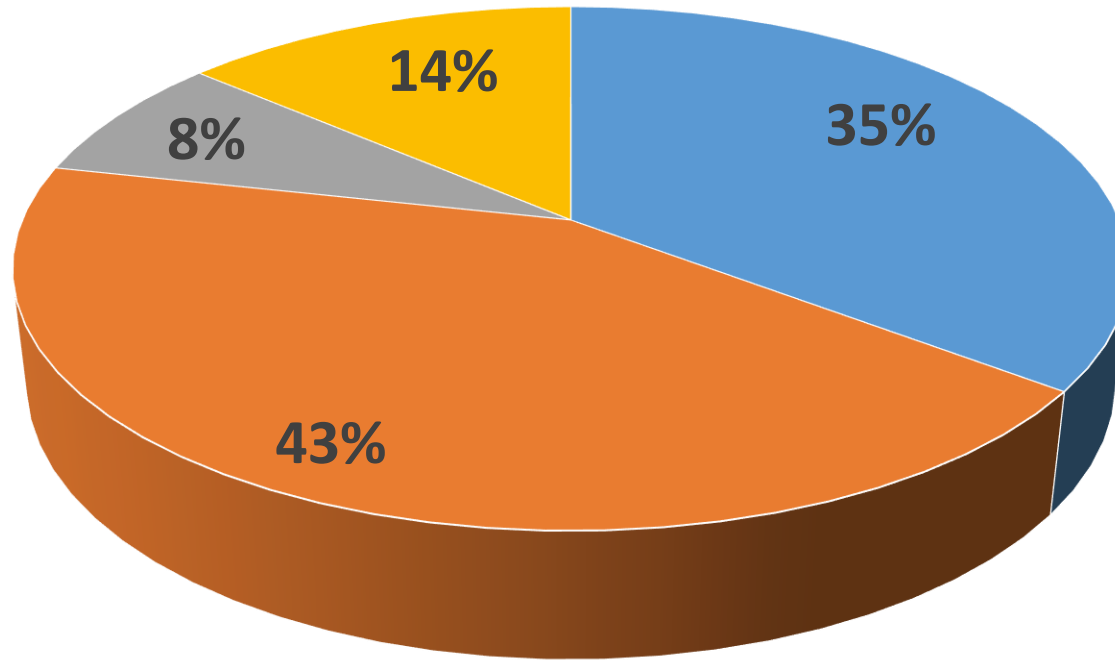


Q: Check the boxes that best describe your business (more than one box can be checked).

■ Brewery ■ Brewery with Bar ■ Brewery with Restaurant and Bar ■ Other



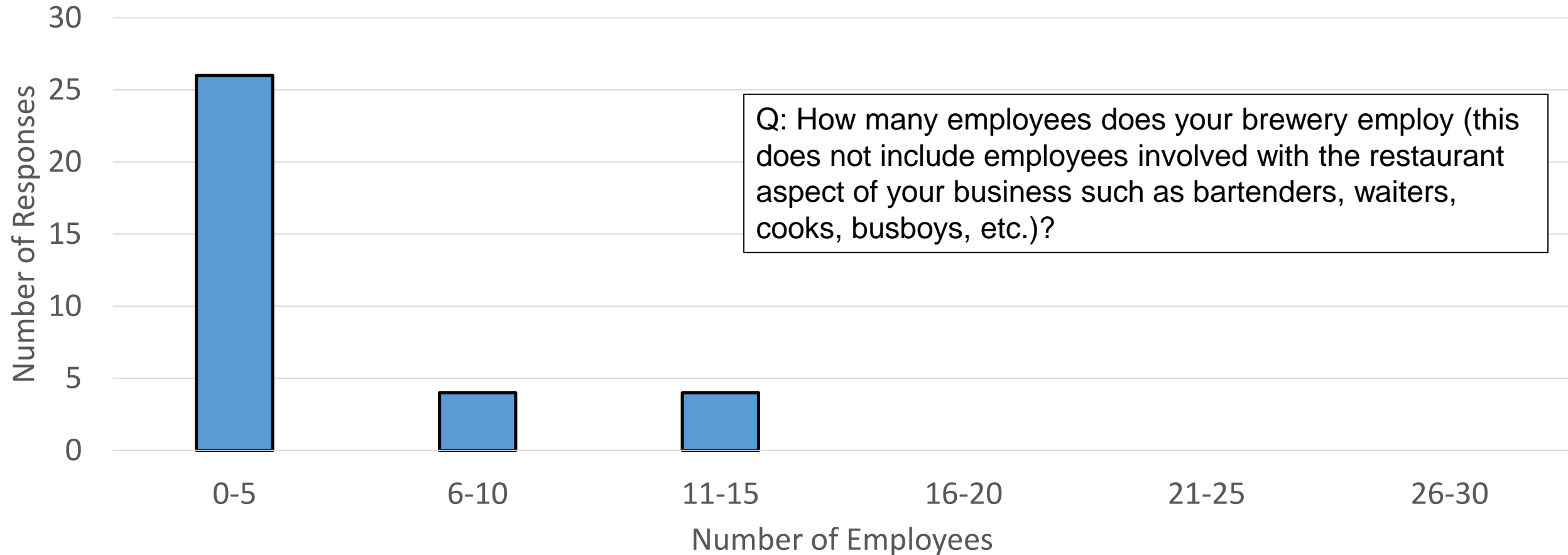
# Brewery Survey Respondents' Business Roles, n = 51



Q: What is your role or position in the business (check all that apply)?

■ Owner/Investor   ■ Master Brewer   ■ Marketing   ■ Other

# Number of Employees Related to the Brewery Operation, n = 34



### **Tours Offered**

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Craft Brewery, n = 33

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Yes	55%
No	45%

### **Price of Tours**

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Craft Brewery, n = 16

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Average	\$3.81
Minimum	\$0.00
Maximum	\$12.00

Q: Does your craft brewery offer public tours? If yes, indicate the cost per person.

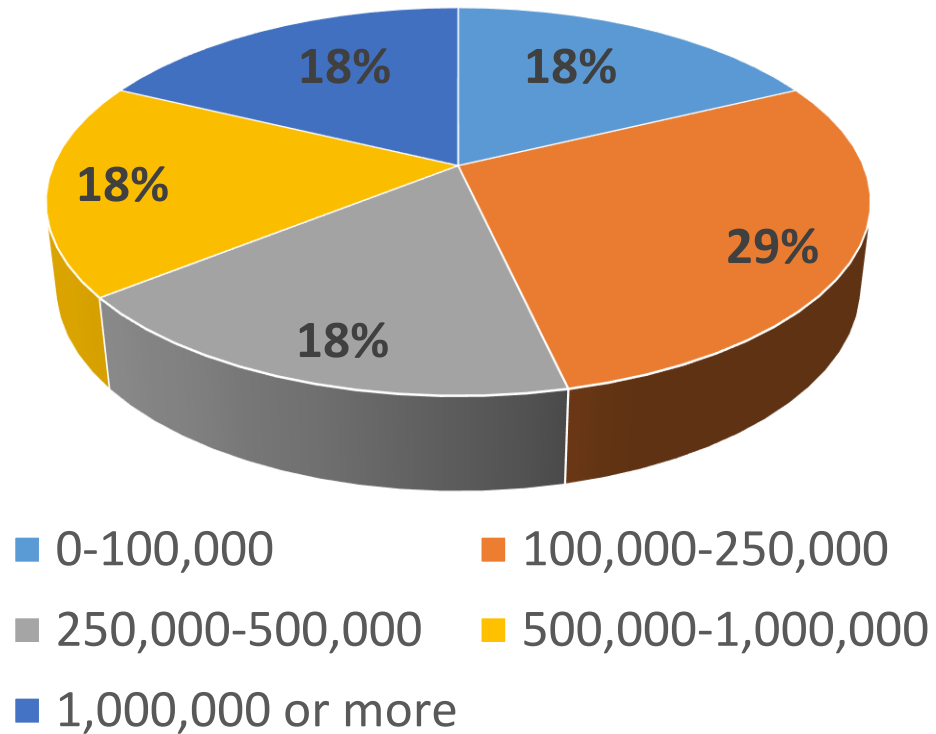
### **Implication for hop growers:**

Can a tour of the hop yard be incorporated?

Likely would require partnering with a brewers association

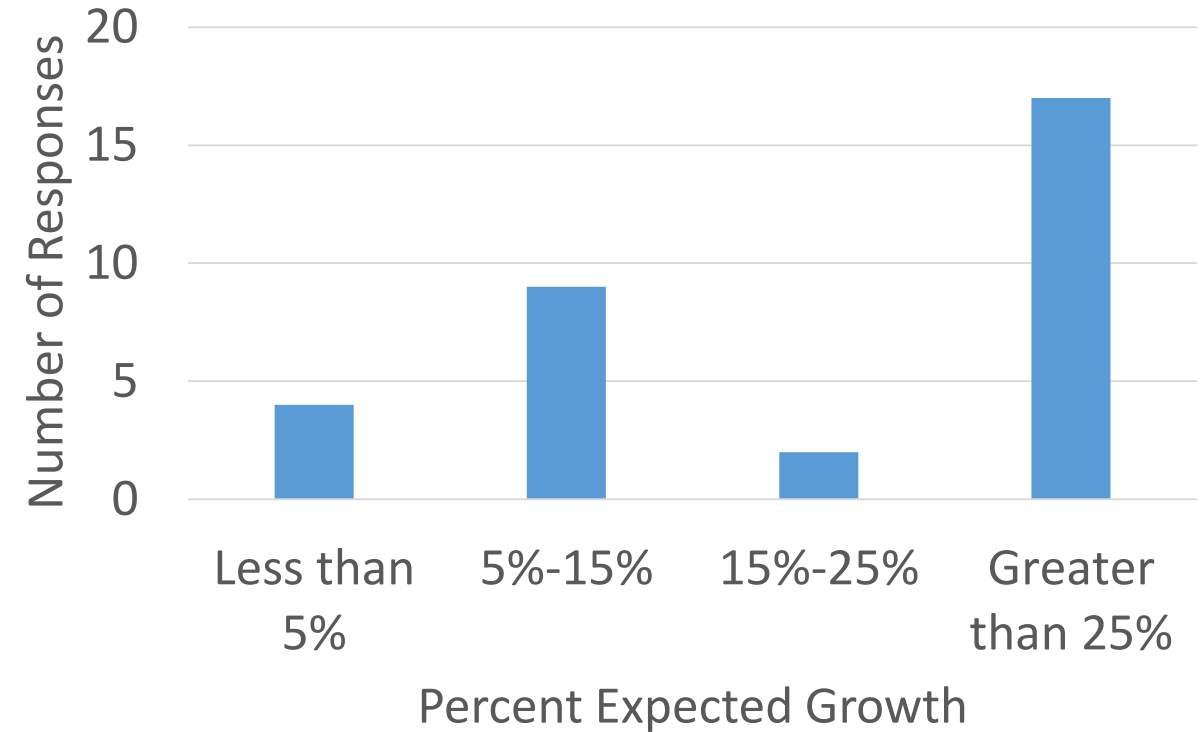
Highly dependent on proximity.

## Annual Gross Alcoholic Beverage Sales - Breweries, n = 28



Q: What was the value of your gross alcoholic beverage sales in the last fiscal year?

## Expected Sales Increase Over Next Five Years - Breweries



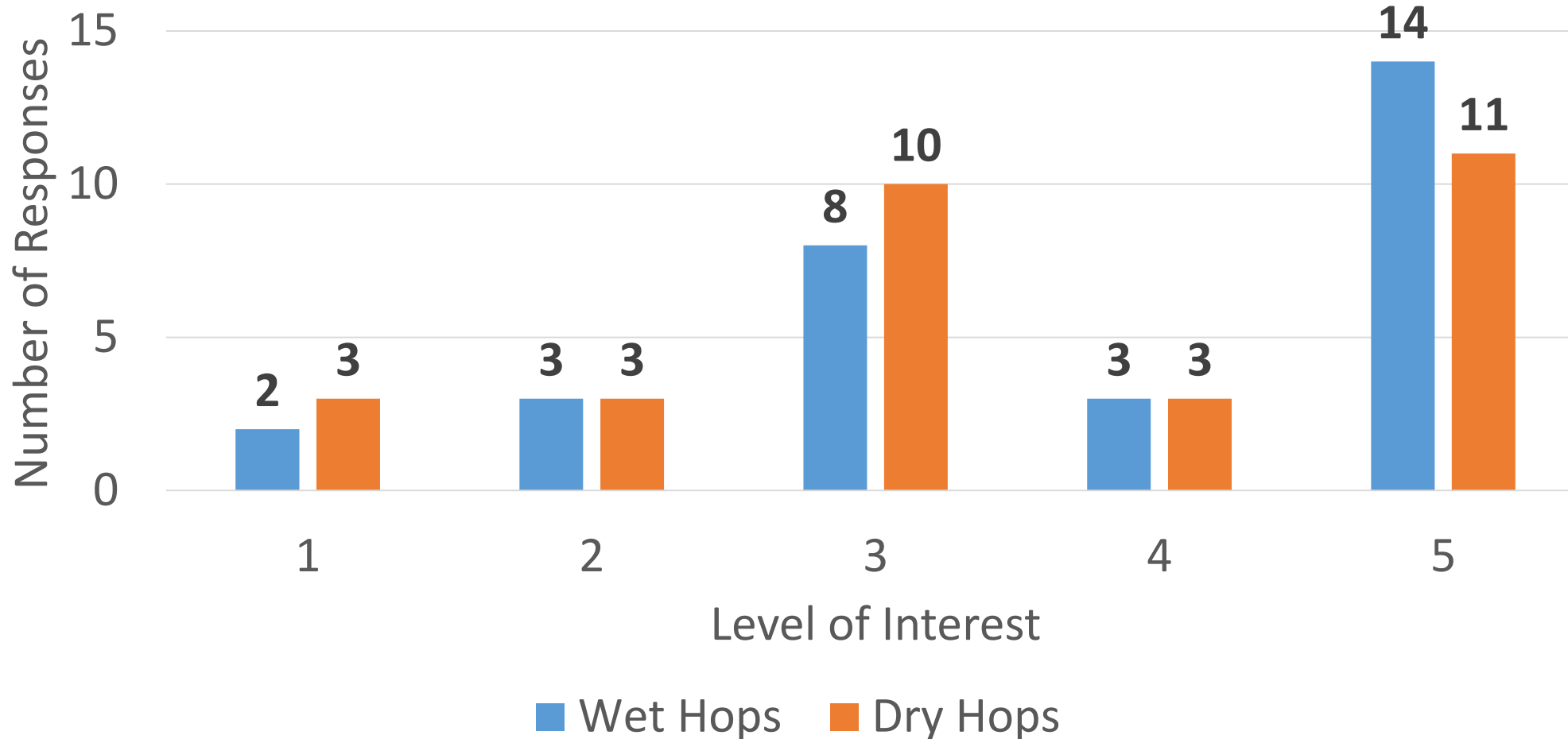
Q: How much do you expect your sales to increase over the next five years?

Q: Rank in order of importance factors that may have a negative impact on the anticipated growth of your craft brewery (1 is most important, 7 is least important). N=31.

<u>Average Response Values for Factors Impacting Economic Growth</u>						
Economic Downturn	Government Regulations	<b>Industry Saturation</b>	Profitability	Quality of Labor	Waste Disposal	Other
3.5	3.1	<b>2.0</b>	3.1	4.5	5.5	6.7

Other responses: poor quality product, high maintenance equipment companies, breweries that don't know what they're doing

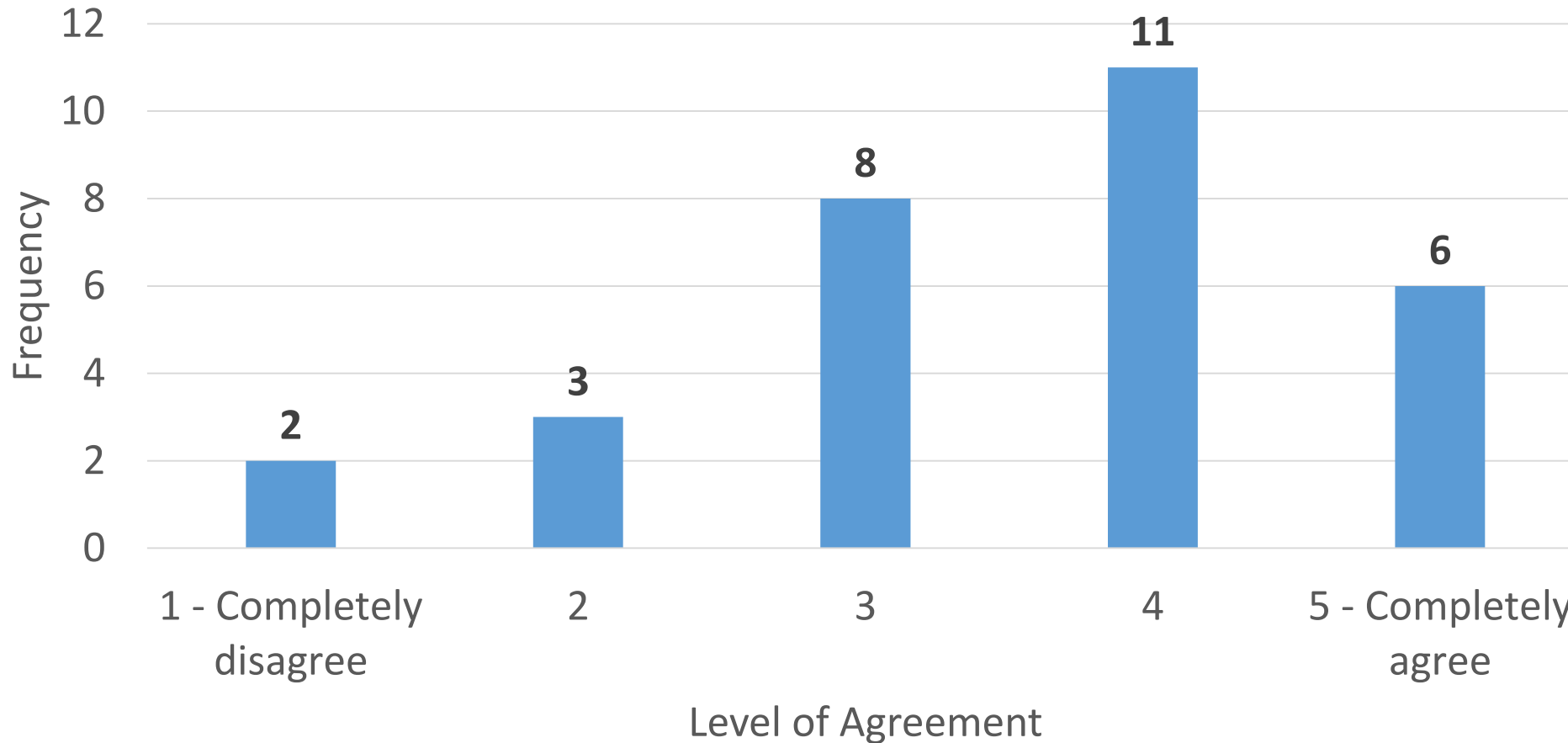
# Interest in Purchasing Tennessee-Grown Hops, n = 30



Q: Please indicate your level of interest in the following with 1 as not interested at all and 5 as very interested: -  
Purchasing Tennessee grown hops for a wet-hops beer and dry or pelleted hops for beer.

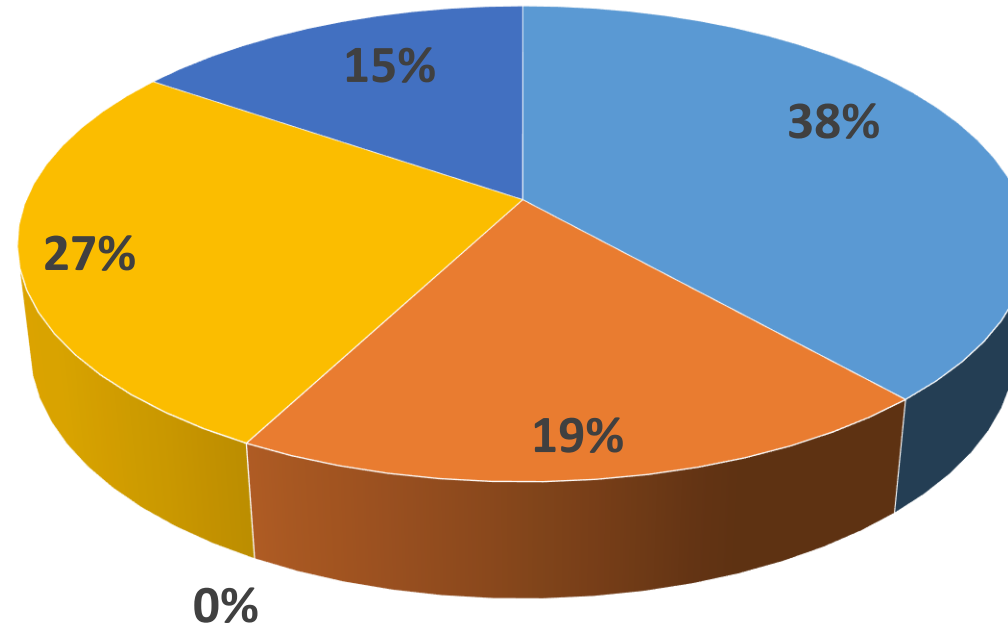


# Frequency of Responses When Asked Whether Respondents Are Only Interested in Using Pelletized Hops, n = 30



Q: Please indicate your level of agreement with the following statement (1 indicating completely disagree and 5 indicating completely agree):  
- I am only interested in using pelletized hops with one being complete disagreement and five indicating complete agreement."

## Willingness to Pay a Price Premium for a Tennessee Malting House Using Tennessee-Grown Barley, n = 26



Q: If a commercial malting house using Tennessee malting barley was available in Tennessee, would you pay a price premium (compared to your current supplier) for malt barley of....

- Up to a 10% price premium
- A 10 to 25% price premium
- A greater than 25% price premium
- No price premium
- Unsure

## Pounds of Hops Used Annually, n = 30

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	Wet Hops	Dry/Pelletized Hops
Average	46	2,301
Maximum	500	16,500
Minimum	0	100

Q: How many pounds of the following categories of hops does your brewery use annually? - Wet hops, Pelletized (or dry) hops - Pounds per year

# Hop Varieties Used at Craft Breweries in Tennessee

- The top five varieties of hops by frequency (not quantity) were:
  1. Cascade
  2. Citra
  3. Mosaic
  4. Amarillo (T), Centennial (T), Hallertau (T), and Magnum (T),
  5. Simco.
- Other Hops Listed: Ace, Apollo, Azacca, Blanc, Brewers, Calypso, Chinook, Columbus, Crystal, Dorado, ekg, Ekuanot, El, Ella, Enigma, Galaxy, Galena, Gem, Gold, Goldings, Hallertauer, Hood, Loral, Mittlefruh, Motueka, Nelson, Noble, Northern, Nugget, Pacific, Piney, Rakau, Saaz, Sauvín, Sorachi, Summit, Tentenger, Warrior, and Willamette.

Q: Please list the varieties of hops used at your brewery in order of the largest quantity used to the smallest quantity used (if you are unsure please indicate "unsure" in line 1)

Gallons of Primary Product Produced	
	Last Fiscal Year
	Breweries, n = 19
Average	46,580
Minimum	900
Maximum	384,000
	Current Fiscal Year
	Breweries, n = 24
Average	50,425
Minimum	275
Maximum	400,000

Q: Please provide your estimated production in gallons of primary product (beer) for the last fiscal year and predicted production for the current fiscal year. - Beer (in gallons) - Last fiscal year and current fiscal year

\*These summaries do not include values of zero for breweries that were not in production for the most recent fiscal year.

## Number of Batches Produced Weekly

### Number of Batches Produced

Breweries, n = 26

Average	2.65
Minimum	0.25
Maximum	7

### Gallons Produced per Batch

Breweries, n = 26

Average	1,873
Minimum	10
Maximum	36,000

Q: In the last fiscal year, how many batches did you produce per week? And what was the average batch size? - Gallons per batch



# Comments on Needs for the Brewing Industry

- “I'd like to see further studies on sustainable integration and marketing of value added products. For example, Tennessee Whiskey is arguably the MOST famous agricultural product in the world, yet when we talk about it being made from honest and sustainable Tennessee grain, people have no idea what that really means....”
- Lack of Tennessee inputs: the southeastern climate is not conducive to growing hops.
  - Skeptical about the viability of any large-scale hop production in Tennessee.
- Information regarding the viability of growing hops, especially for farmers who are struggling to keep their farms together in East Tennessee

# Comments on Needs for the Brewing Industry

- This is a highly capital intensive business...sufficient capital is always a problem
- Marketing techniques per region: Employee pay and benefit averages and skill levels
- “Tennessee has the highest end to end taxation on beer in the country and due to a non-consolidated state level licensing regime, is one of the most legally complex to become licensed in. This legal complexity was lobbied for by beer giants primarily to prevent new craft beer entrants. I would like more analysis specifically determining the economic impact this adverse regulatory environment is having on Tennessee brewers as compared to more favorable environments like Colorado, California, or Washington.”

# Comments on Needs for the Brewing Industry

- More research on impact of brewery loading of wastewater treatment. Positive, negative, no change, and best practices when building.
- Availability of local livestock businesses or composting facilities to remove spent grain.
- Consumer awareness of economic benefits of buying "local beer."



Cost considerations and revenue expectations: highly variable

# **COST OF PRODUCTION**

# Cost of Production

- Revenue
  - Multi-year estimates
- Establishment Cost
  - Trellis System
  - Planting
  - Irrigation
- Annual Costs
  - Pre-harvest
  - Harvest



\*\*\*Tremendous variation in costs and revenue exist\*\*\*

# Hops Revenue

- In General (% of expected yield): Year 1 – negligible; Year 2 – 50%; Year 3 – 75%; Year 4 and beyond – 100%.
- Yields / Variety
  - Cascade, Nugget, Chinook, and Centennial
    - 1,200 to 1,800 lb established yield?
    - Right now more common 500-1,000 lb
- Prices dried
  - 2017 US average: \$5.96 per pound
  - \$7-\$15 per pound reported regionally (highly variable)





# ESTABLISHMENT COSTS

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## Trellis Construction

<b>Materials</b>	<b>Quantity</b>	<b>Unit</b>	<b>Cost/Unit</b>	<b>Total Cost</b>
Poles (Black Locust)	77	pole	\$ 80.00	\$ 6,160.00
Wire Rope (1/4")	4000	ft	\$ 0.25	\$ 1,000.00
Wire Rope (3/16")	9600	ft	\$ 0.25	\$ 2,400.00
Eye bolts	84	bolts	\$ 3.25	\$ 273.00
Shoulder Bolts	52	bolts	\$ 5.00	\$ 260.00
Turnbuckles	44	buckles	\$ 15.00	\$ 660.00
Ground anchors	52	anchors	\$ 14.50	\$ 754.00
Thimbles (1/4")	160	thimbles	\$ 0.85	\$ 136.00
Cable clamps (1/4")	320	clamps	\$ 0.50	\$ 160.00
Cable clamps (3/16")	300	clamps	\$ 0.80	\$ 240.00
<b>Equipment</b>				
Auger	4	day	\$ 100.00	\$ 400.00
Forklift	4	day	\$ 350.00	\$ 1,400.00
Lift	12	day	\$ 235.00	\$ 2,820.00
Drill	1	tool	\$ 40.00	\$ 40.00
Cable cutter	1	tool	\$ 30.00	\$ 30.00
Comealong	1	tool	\$ 40.00	\$ 40.00
Haven grip	1	tool	\$ 60.00	\$ 60.00
<b>Labor</b>				
Bobcat and auger work	24	hours	\$ 7.25	\$ 174.00
Setting poles	72	hours	\$ 7.25	\$ 522.00
Ground anchor installation	32	hours	\$ 7.25	\$ 232.00
Anchoring posts	56	hours	\$ 7.25	\$ 406.00
Top wire installation	88	hours	\$ 7.25	\$ 638.00
Bottom wire installation	48	hours	\$ 7.25	\$ 348.00
<b>Total Trellis Construction Costs</b>				<b>\$ 19,153.00</b>

# Trellis Construction

Source: Virginia  
Tech Hops Budget

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# Planting Cost

Planting					
	Materials	Quantity	Unit	Cost/Unit	Total Cost
	Rhizomes	800	rhizomes	\$ 2.00	\$ 1,600.00
	Mulch	20	cubic yards	\$ 18.00	\$ 360.00
	<b>Labor</b>				
	Planting	96	hours	\$ 7.25	\$ 696.00
	Mulching	24	hours	\$ 7.25	\$ 174.00
	<b>Site Prep</b>				
	Discing	1	acres	\$ 15.00	\$ 15.00
<b>Total planting costs</b>					<b>\$ 2,845.00</b>

Source: Virginia  
Tech Hops Budget

# Irrigation Costs

Irrigation System					
Materials	Quantity	Unit	Cost/Unit	Total Cost	
Mainline (10' 3/4" PVC)	40	sections	\$ 2.10	\$	84.00
Laterals (1/2" poly)	4	roll (1000')	\$ 120.00	\$	480.00
PVC fittings (risers)	160	fitting	\$ 0.49	\$	78.40
Poly tube fittings	40	fitting	\$ 0.54	\$	21.60
Irrigation pump (1 HP)	1	pump	\$ 280.00	\$	280.00
Pump fittings	4	fitting	\$ 8.00	\$	32.00
Pressure regulator	1	fitting	\$ 12.50	\$	12.50
Mesh filter	1	filter	\$ 18.00	\$	18.00
Cistern (10000) gallon	1	cistern	\$ 5,800.00	\$	5,800.00
Drip emitters (2000 total)	8	bags	\$ 62.50	\$	500.00
Zip ties (4000 ties)	4	bags	\$ 24.50	\$	98.00
<b>Labor</b>					
Dig mainline trench	12	hours	\$ 7.25	\$	87.00
Install mainline	60	hours	\$ 7.25	\$	435.00
Zip tie laterals	16	hours	\$ 7.25	\$	116.00
Install drip emitters	28	hours	\$ 7.25	\$	203.00
Cistern and pump setup	5	hours	\$ 7.25	\$	36.25
<b>Total Irrigation System Costs</b>				<b>\$ 8,281.75</b>	

Source: Virginia  
Tech Hops Budget

# Establishment Costs Summary

Cost Category		1 Acre Cost
Total Trellis Construction Costs		\$ 19,153.00
Total Planting Costs		\$ 2,845.00
Total Irrigation System Costs		\$ 8,281.75
<b>Total Establishment Costs</b>		<b>\$ 30,279.75</b>



# Annual Costs

- Pre-Harvest
  - Fertilization
  - Weed/Insect/Disease Control
  - Plant/trellis/irrigation maintenance
  - Equipment
  - Land rent/taxes
  - Labor
- Harvest
  - Equipment
  - Labor
  - Processing(drying  
pelletizing)/handling/transportation
- Marketing
- Return to management

Example (adopted form MSU Budget)	Established (>yr4)
Pre-harvest	
Coir (String & Clips)	480
Labor	1,500
Insect/Weed/Disease Control	600
Consultants	100
Fertilization	275
R&M	250
Machinery/Labor	950
Total	4,155
Harvest	
Labor	600
Machinery	1,250
Total	1,850
Post Harvest	
Picking and processing	9,000
Transportation and Marketing	500
Total	9,500
Total	15,505



# Cost of Production Summary

- Establishment Costs = \$8,000-\$36,000 per acre
- Annual Costs = \$8,350-\$15,500 per acre
- Revenue: \$3,500 (\$7/lb x 500lb) to \$27,000 (1,800 lb x \$15)

	Average	Low	High
Establishment Costs (annualized): \$/acre	\$3,205	\$1,409	\$6,484
Annual Costs: \$/acre	\$11,257	\$8,350	\$15,505
<b>Total Cost: \$/acre</b>	<b>\$14,462</b>	<b>\$9,759</b>	<b>\$21,989</b>

- Huge variations in reported establishment and annual costs
- Labor versus capital cost for harvest and other functions



Strategies

# MARKETING AND OTHER MARKET OPPORTUNITIES

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# Other Sources of Revenue

- Group picks
- Special events
- Hop yard tours
- Processing drying / pelletizing / hop extract
- Custom harvesting / machinery share

# Other Market Opportunities

- Craft Breweries
- Home Brewing
  - Data deficient
- Agri-Tourism
- Vertical integration of the marketing system
- Co-operatives



Questions and discussions

**THANK YOU**

