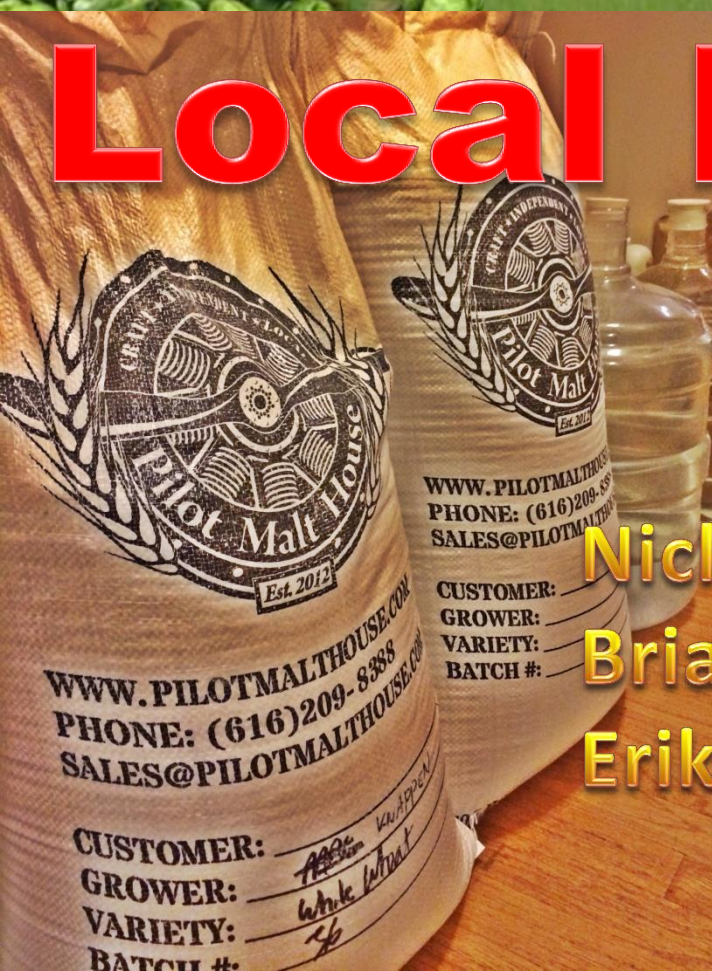


Farm to Glass: Brewing with Local Ingredients



Nick Rodammer

Brian Tennis, Michigan Hop Alliance

Erik May, Pilot Malt House





Introduction & Overview

- Who is growing hops/barley and where?
- Local Hop Farming
- Craft Malting
- What do the brewers think?
- Future of local ingredients sourcing
- Yeast and other ingredients
- Q&A





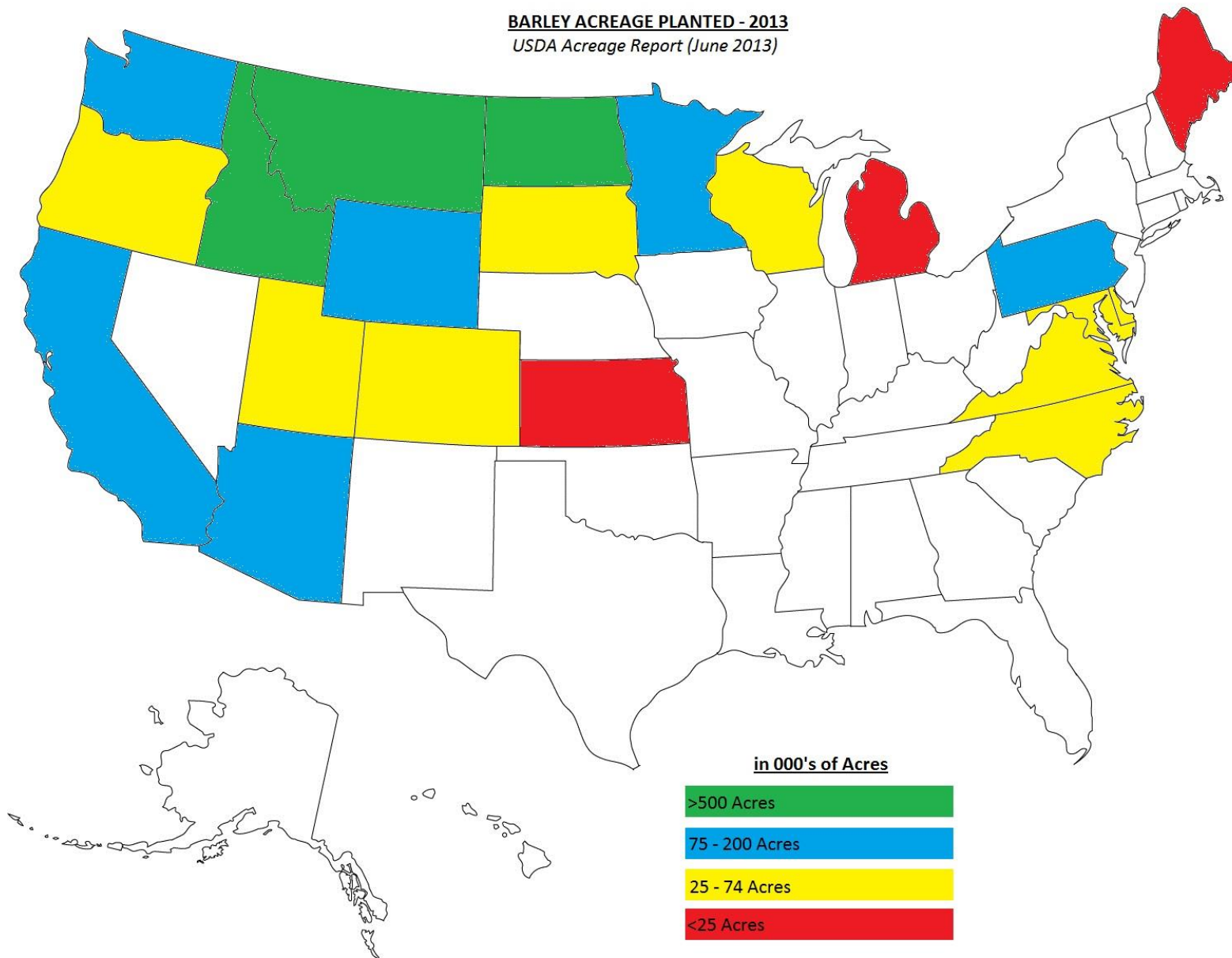
What does “locally sourced” mean?

- Raw materials are grown within your region
 - What does region mean? Varies by location.
- Harvested, processed packaged by a locally owned company
- Non-industrial in scope



Where is barley growing?

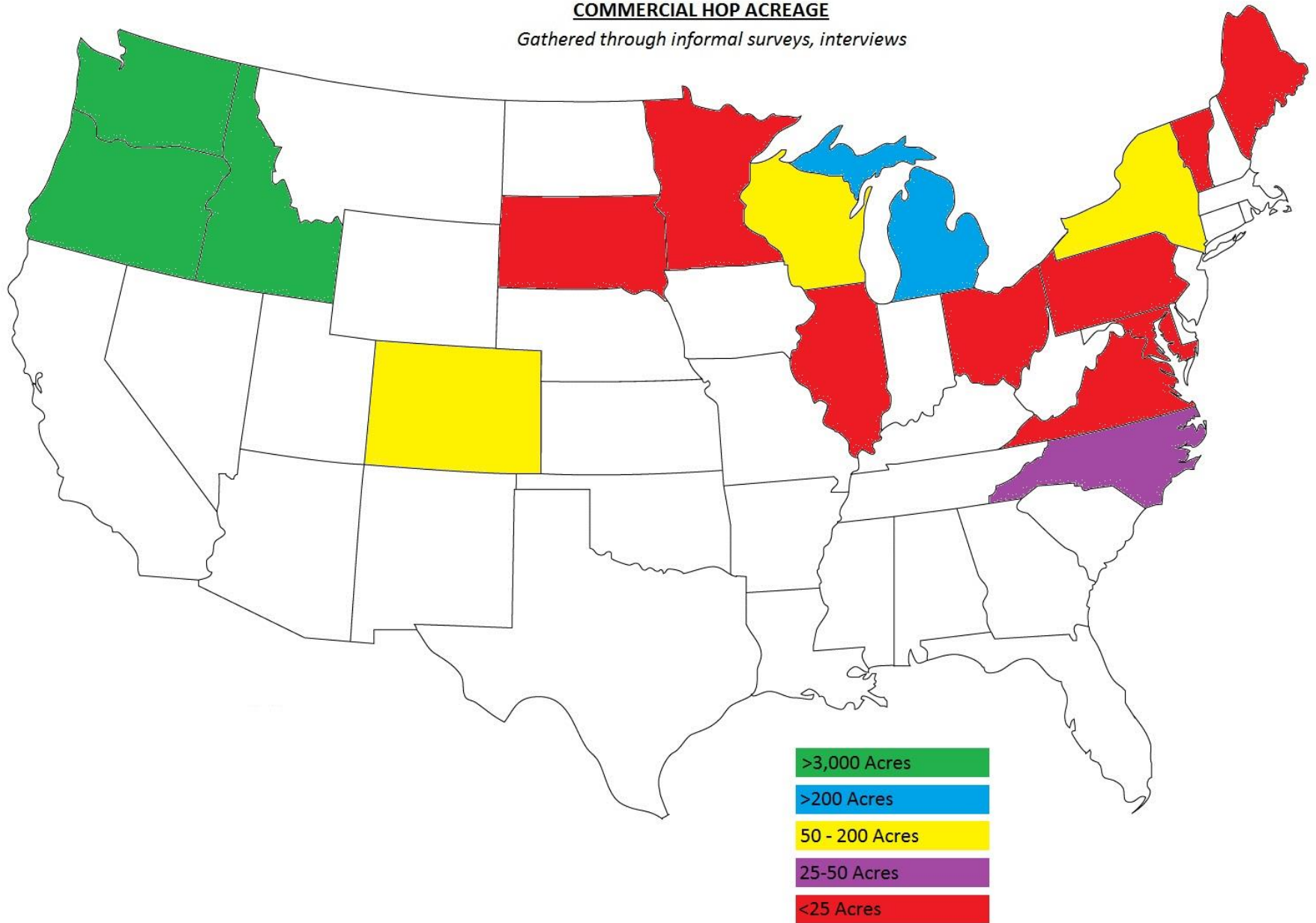
BARLEY ACREAGE PLANTED - 2013
USDA Acreage Report (June 2013)



Who is growing hops commercially?

COMMERCIAL HOP ACREAGE

Gathered through informal surveys, interviews





Hop Growers Survey

Conducted in Spring 2014

- 10 question survey
- 78 growers responded
- Conducted with the assistance of several growers associations and co-op's



Acres and Age of Farm

States	# Farms	2014 Acreage	Avg Acreage	Avg Age of Farm
MI	19	206.1	10.85	2.22
CO	6	31.0	5.17	4.00
NY	9	14.5	1.61	2.00
NC	13	10.0	0.77	2.31
ME	2	9.5	4.75	4.00
VA	13	6.5	0.50	1.00
WI	2	6.3	3.15	3.00
MN	7	3.3	0.46	0.71
PA	2	2.3	1.13	2.00
MD	2	1.3	0.67	2.00
OH	1	1.0	1.00	6.00
	78	298.0		2.17



Varieties being grown



41 different varieties identified

- Cascade – 87%
- Chinook – 49%
- Nugget – 47%
- Centennial – 36%
- CTZ – 29%
- Willamette – 22%
- Mt Hood – 10%





Varieties being grown



- Other Notable varieties
 - Proprietary (4 growers)
 - Pacific Gem (Native to New Zealand)
 - AlphAroma (aka Rakau, also native to NZ)
 - Sorachi Ace
 - Tahoma (new USDA release)
 - Columbia (reintroduced in 2011)
 - Neo 1 (Neomexicanus)





Alliances, Co-op's, Associations, etc

- Northeast Hop Alliance – 14
- Old Dominion Hop Co-op – 13
- Michigan Hop Alliance – 7
- Minnesota Hop Growers Association – 6
- Southern Appalachian Hops Guild – 3
- Wisconsin Hop Exchange – 2

- No affiliation – 26



Farm Size

Size of Farm	# of Farms	%		Total Acreage	%
< 0.25	7	9.0%			0.0%
0.25 to 0.5	22	28.2%		8.81	2.9%
0.51 to 0.99	0	0.0%		0	0.0%
1 to 2.99	30	38.5%		41.3	13.6%
3 to 4.99	4	5.1%		15	4.9%
5 to 9.99	9	11.5%		54	17.8%
10 to 19.99	4	5.1%		40.6	13.4%
>20	2	2.6%		144	47.4%

For Comparison: Average Yakima Valley farm = 450 Acres



Growing Organic



	Now	Plan to in the Future
Yes	10	6
No	68	59





Pellets, Cones or Both?



	Alliance/Co-Op	Independent	Total
Whole Cone/Leaf	32	16	48
Both Whole Cone/Leaf and Pellet	18	10	28
Pellet	1	0	1





**Low Trellis grown Summit Hops at New Mission
Organics Hopyard in Omena, MI**

Who is the Michigan Hop Alliance?

- A farmer owned collective of growers
- Growers, processors, marketers
- Focus on sustainable growing and high quality
- Both certified organic and conventional growers
- First commercial acreage in Michigan in close to 100 years



"We may be small, but our cones are big."



New Mission Organics

- 30 acre Certified Organic farm in Omena, MI
1st and largest certified organic hopyard in MI
- Growing 10 acres of hops for the 2014 harvest
- 7 varieties: Brewers Gold, Cascade, Centennial Chinook, CTZ, Pacific Gem, Summit™
- Only farm outside of the Pacific Northwest using a low trellis growing system (Summit™)



NEW MISSION
★ **ORGANICS** ★



Harvest





Startup Challenges

- High startup cost 10-12K per acre, plus the equipment, barn, well, etc
- Sourcing inputs, rhizomes or plants, poles, etc.
- Plants in MI take 2 years for maturity, 3 if you use rhizomes
- Proving quality and consistency of supply, taste profile



Hopyard Construction





Challenges for a Small Grower

- Learning curve!
- Labor. Can't teach passion
- Equipment \$\$\$ Picker, oast, mill, pellet, sealer
- Challenges of packaging. Industry standards
- Challenges in making sure quality assurance is high. Testing at every point
- Capital constraints = Wasn't a proven model





Why Source Locally Grown Hops?

- Not knocking the big boys
- Freshness
- Wet Hops
- Availability: we have product
- Buy local movement!
- Contracts: long term or short
- Brewer needs: what they want, exclusives
- Personal level connection





Local Flavor & Terroir

- Michigan hops taste different even by region
- Different soil, different climate
- Several varieties we are trialing, NZ, Japan, Poland, Germany, Kazi





Hops – Other Notables

- Unique varieties unique to specific regions
 - Michigan Landrace varieties
 - 16 – 20 different varieties
 - Several currently in trials, a few already released
 - Flavor/aroma range from noble-like to tropical fruit
 - New trials in process crossing these landrace varieties with existing hops. Potential for something completely new!
 - New York
 - Heirloom Cluster
 - Neomexicanus
 - Native to New Mexico and Southern Colorado





Great Lakes Hops, Zeeland, MI



Great Lakes Hops, Zeeland, MI

Wet Hops

- Large opportunity for local growers
- Perfect for very small farmers (<1 acre)
- Shorter transit time from vine to kettle
- Creates opportunities for small brewers when a wet hop beer may not have been prior



Craft Malt



Riverbend Malt House, Asheville, NC



What is Craft Malt?

- Malt made with more than 50% locally sourced grains
- No chemical additives during processing
- Made by a Craft Malthouse
 - Up to 10,000 tons per year
 - Independently owned



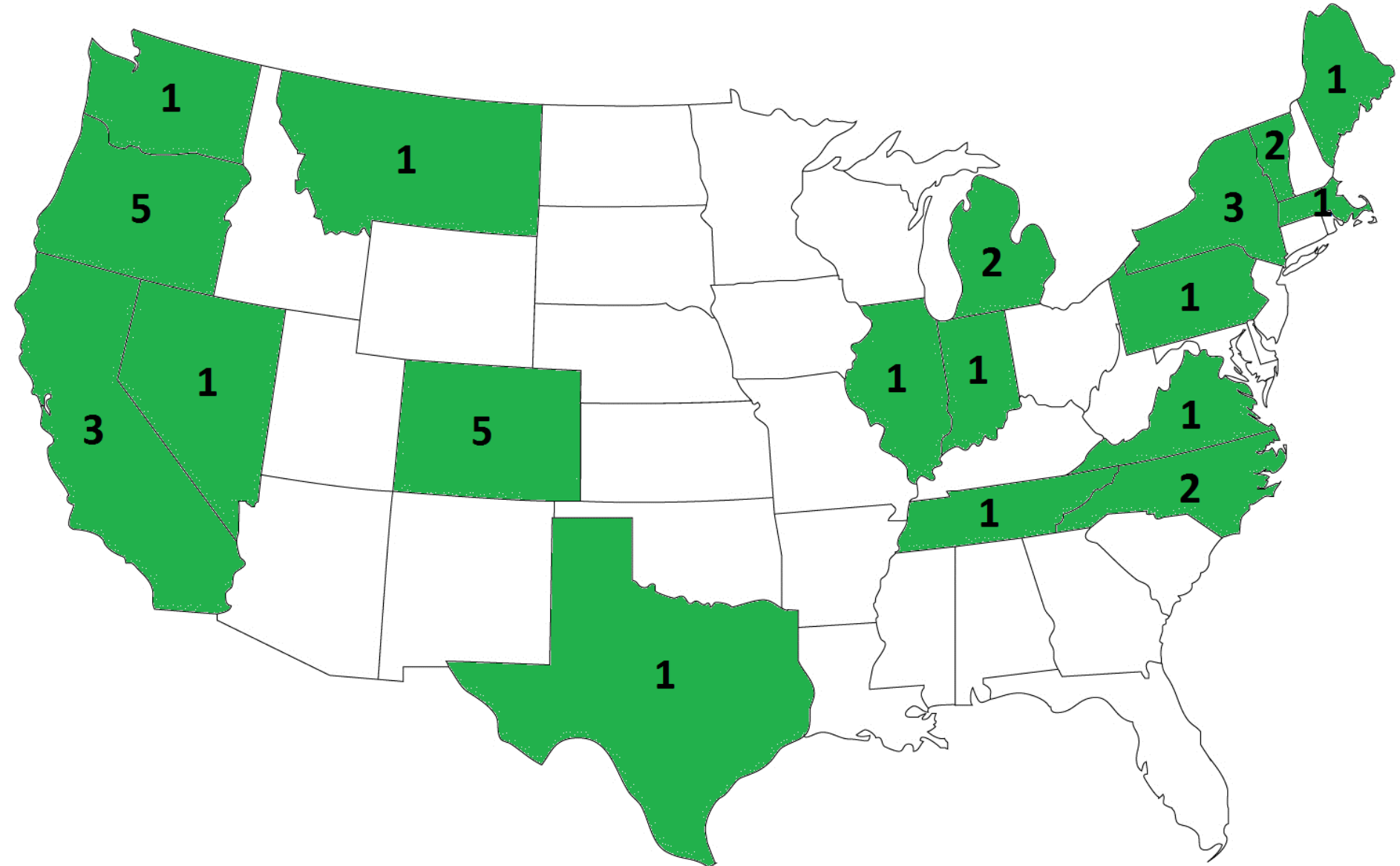


Craft Malting Overview

Malt House Type	#	Annual Capacity	Avg Capacity	Avg Batch Size
Sales	18	2,692	150	1.44
Brewery	2	16	8	0.25
Distillery	2	200	100	1.50
Construction	15			



Craft Malt House Locations





Craft Malting Capacity



Capacity (tons)	#	Total Capacity	%	Avg Batch Size
< 50	5	131	5%	0.8
50-99	6	348	13%	0.9
100-199	4	488	18%	1.1
>200	3	1725	64%	4.0



Craft Malting - Products

- All offer a base malt
 - Not all base malt is built the same! (more on this later)
- Gluten Free Malt
- Crystal Malt (offered by roughly half)
- Custom malting
- Region specific products





Pilot Malt House



Pilot Malt House

- 1,000sf with initial output of 200-300lbs weekly, now close to 2,000lbs
- Re-Purposed tanks, kiln, grain cleaning equipment
 - Kiln is ‘crux’ of our organization, completely designed in house
- Michigan Department of Agriculture ‘Food Grade Producer’ license
- Business idea hatched in summer 2012, licensed in August 2013





Before it was malt...



Startup Challenges

- Main challenge selling product for the first time
 - Skepticism – Can Michigan produce quality barley? Can we produce quality malt? Can you do so with consistency? Can you do so at a price point that is competitive?
- Creating an infrastructure to sustain a viable malting barley industry here in Michigan
 - Connecting brewers and growers
 - Finding growers willing to grow malting barley
- Capital requirements
 - Ensuring good germinative energy, requires longer storage
 - Equipment





Whitney Farm, Scottville, MI



Sourcing the grain

- Extensive work with Michigan State University's Extension Office, among others
- Working with growers has to be collaborative
 - Extensive discussions and education both ways
 - Initial protein levels have been too high (high protein=cloudy beer)
- Challenges
 - Quality grain is imperative for quality malt – (Should go without saying!)
 - Changing the mentality of growers, making them care as much as we do







Field to Brewery

- Malting: Get it to want to grow, get it growing, kill it
- Timeline
 - 24 Hour Steep
 - 2-3.5 Day Germination
 - 12-20 Hour Kiln
 - 2-4 Hour cleaning/bagging
 - Rest of the time – Cleaning equipment/facility
- In-House Lab
 - With the help of Shorts Brewing Co.
 - Tests done in house: germinative energy, moisture %
 - Eventually: Lovibond, among others





Challenges for a Small Malt House

- Something always has to be done (at least every 8 hours)
- Finding the ‘sweet spot:’ enough product to sustain us while still being a manageable load
- Quality assurance: germinative energy, germination %, moisture %, etc.
- Capital needed to get to ‘next level’
 - Telling our story, ‘What is a malt house?’





Why Source Local Malt?

- Local terroir
 - Our 2-row doesn't taste like Briess'
 - We want it to taste like Pilot's 2-row
 - Creates ownership in our 'brand'
- Ability to create relationship with the grower
 - Our growers name is on every bag
- Pilot 'being local' isn't enough to sustain a business
 - Creating the ecosystem to sustain network of growers, maltsters all support brewing community





Craft Malt – Other Notables

- The malt you get will vary based on region
 - CBC Craft Malt Sensory Workshop (more on this next)
 - Climate
 - Barley that grows well in Montana may not grow well in New England
- Small malt houses can offer more customized products
 - Full lineups of Gluten Free malt
 - Products malted specifically to a brewery's specs





Craft Malt Workshop - CBC

- Conducted at the Craft Brewers Conference in April 2014
- 5 SMaSH beers, all using different malt
- Showcase of regional and varietal differences





Craft Malt Workshop - CBC



Maltster	Fronterac	Colorado Malting	Riverbend	Valley	Pilot
Type of Malt	Pale Ale (2-Row)	Pale (2-Row)	Pale (6-Row)	Pale (2-Row)	Pale (2-Row)
Location	Quebec	Colorado	North Carolina	Massachusettes	Michigan
Years in Operation	8	5	3	4	1
Moisture (%)	5	3.8	4.8	3	4.2
Color	2.46	3.49	2.25	2.68	N/A
Extract % (FGDB)	82.3	80.4	79.7	81.6	76.8
Alpha Amylase	45	61	42	34	85
Diastatic Power	101	125	116	84	198
Total Protein (%)	9.9	13.1	9.5	9.4	15.4
Soluble Protein (%)	4.46	4.21	3.47	4.25	6.6
S/T Ratio	45.1	32.1	36.5	45.2	42.5
FAN	173	143	125	153	281



Alliances/Co-ops/Associations

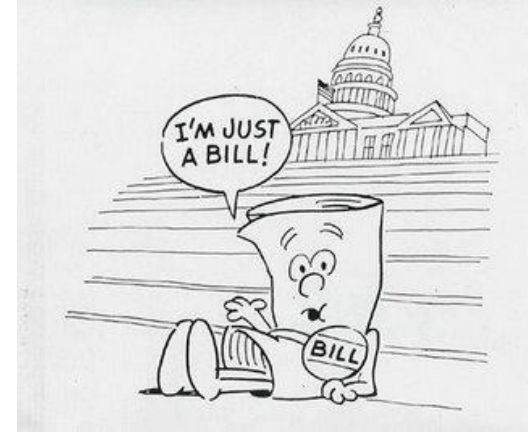
- Pooling resources is critical for small operators
- Often necessary to gain economies of scale
 - Packaging
 - Equipment
 - Distribution/Marketing
- Advocacy





Legislation

- States recognize the benefit to the economy
- Michigan HB 5275: Farm to Glass
 - Tax credits for beer/wine/mead/cider made and sold in MI, if a certain % measures of Michigan grown ingredients were used
- New York Farm Brewery License
 - Issued to breweries who use ingredients grown in NY State.
 - Tax breaks
 - Ability to sell pints at a tasting room w/o an extra permit
 - Ability to open off-site tasting rooms





What about the brewers?

- Survey sent directly to over 100 breweries via email in April 2014
- Link to survey posted to Brewers Association forum in April & May 2014
- 82 total responses
- 8 questions

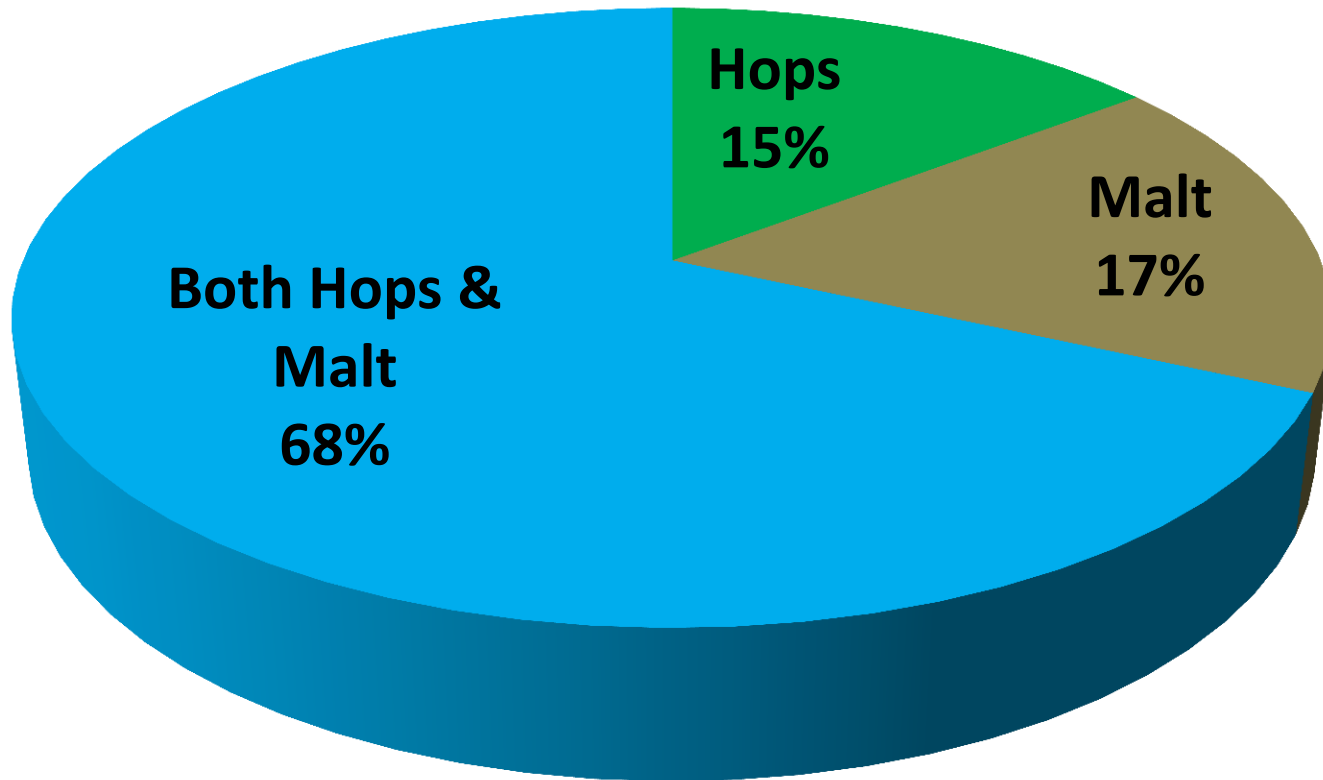


Respondent Locations

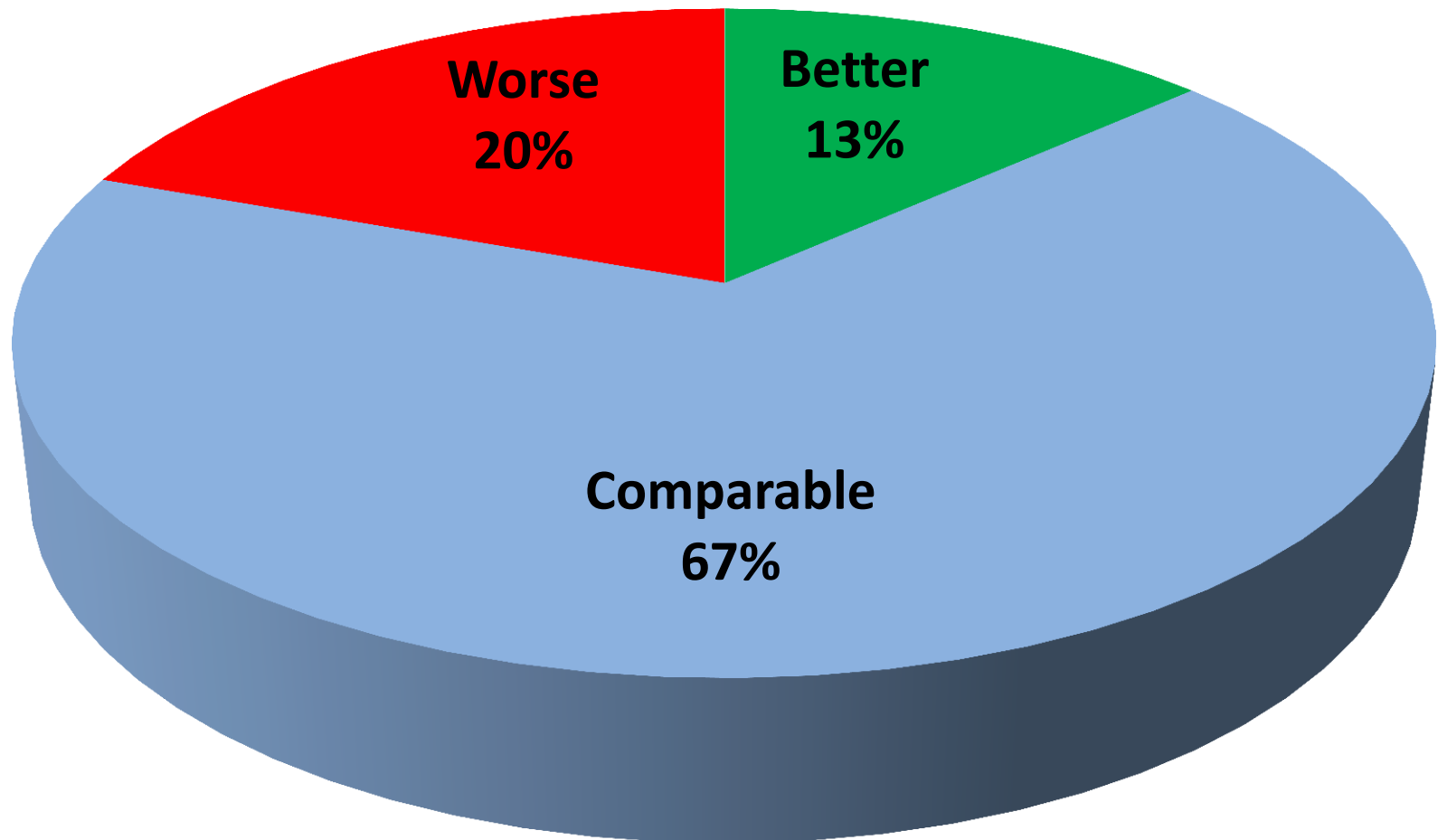
- 28 States represented
- 46% of responses came from MI, CO and NY

STATE	RESPONSES
MI	18
CO	11
NY	9
MA	6
TX	5
CA	4
WI	3
MN, AZ, ID, OR, MD, NC	2
ME, SD, NM, VA, UT, MT, NH, PA, SC, MO, IN, NV, WA, OH	1

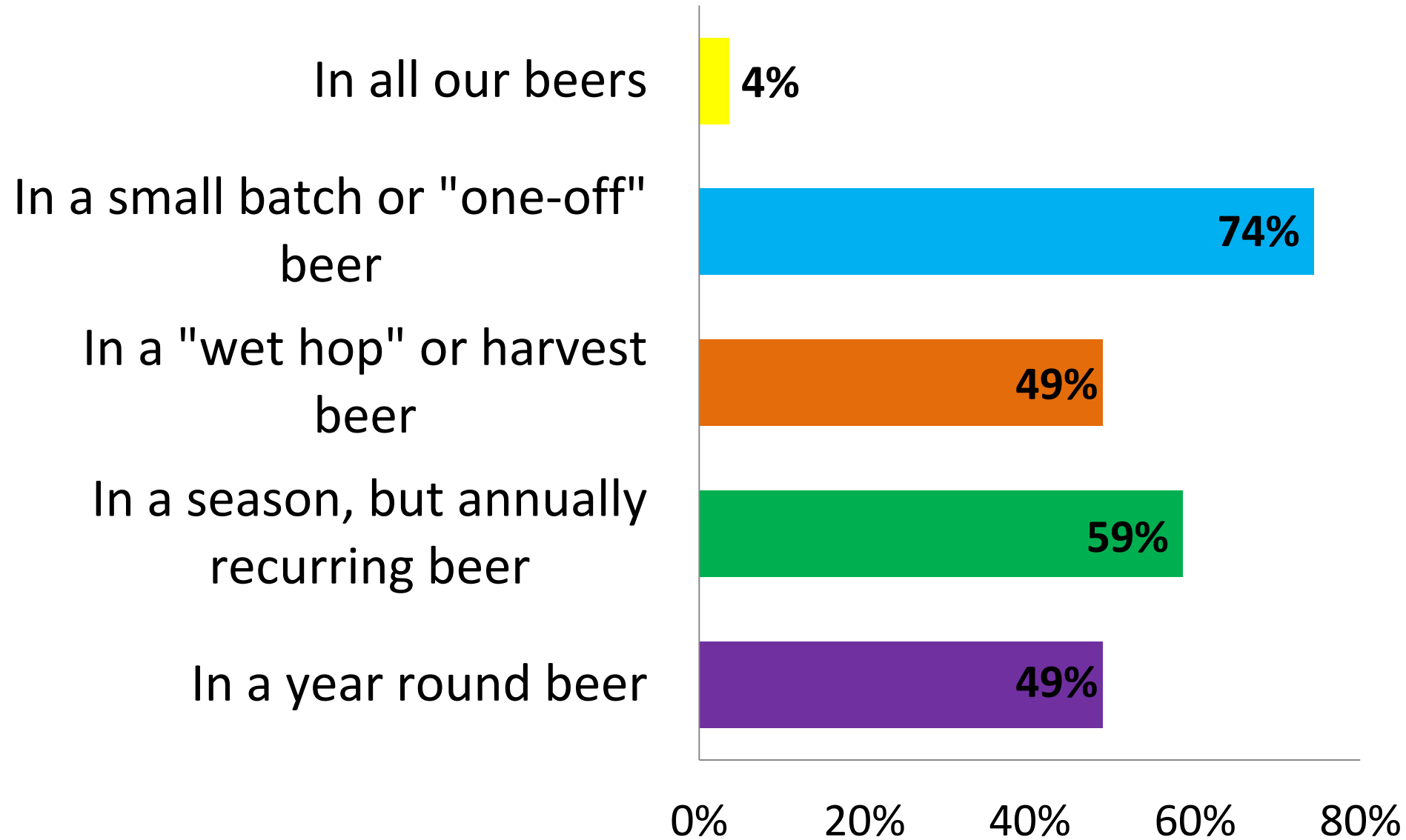
Which locally sourced ingredients have you used?



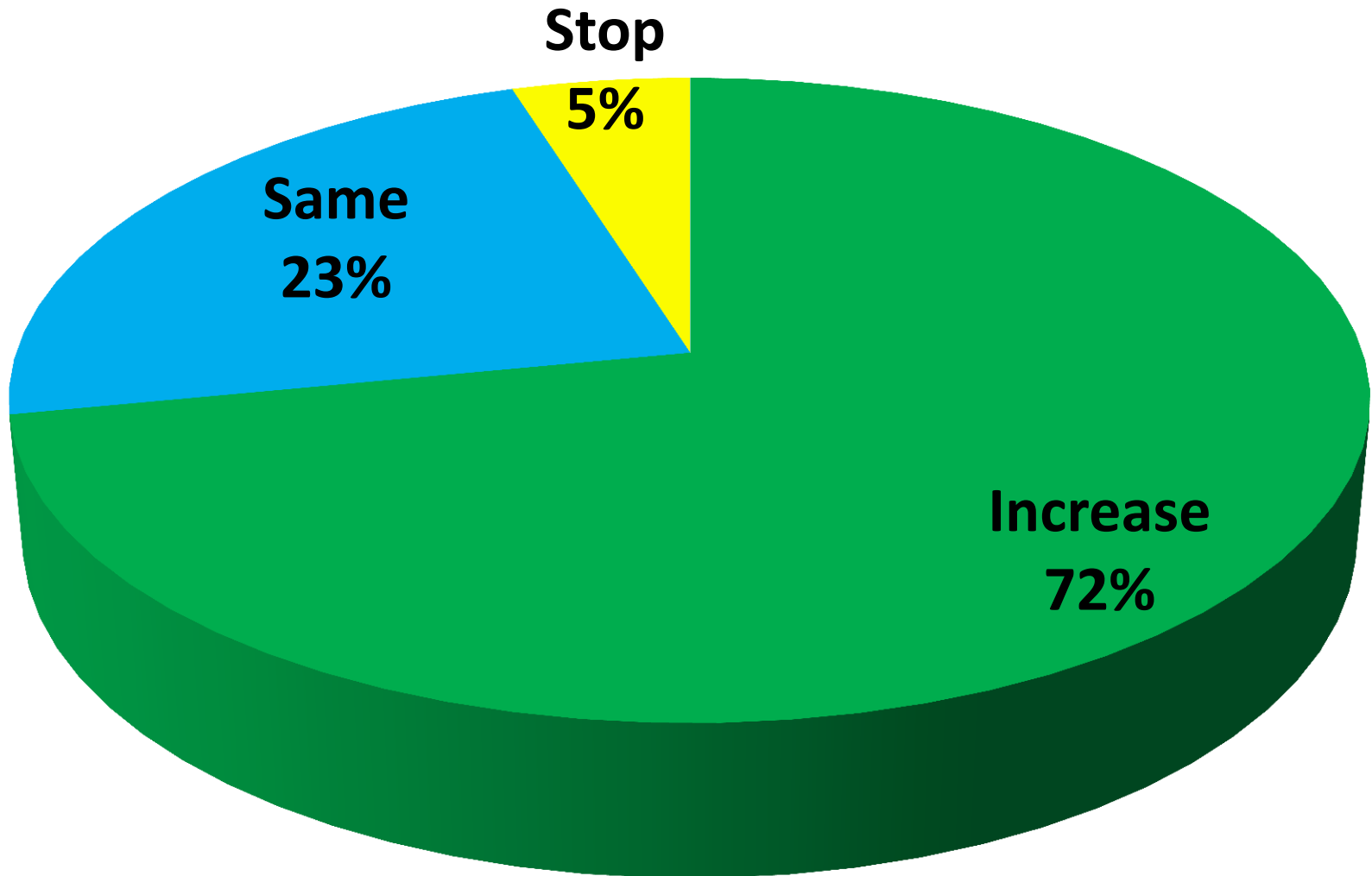
Compared to national/international suppliers, how was the quality of the local ingredients you used (Considering both performance in the brewhouse and the effect on the finished beer)



In which beers do/have you used locally sourced malt and/or hops? (Choose all answers that apply)



How do you anticipate your usage of locally sourced malt and hops will change in the future?



Why did you chose to source local malt and/or hops?

- **Help Local Economy/Growers/Businesses**
- **PR/Marketing/Drive Sales/Branding/Differentiation/Cool Factor**
- Unique & Local Flavors/Terroir
- Local Pride/Sense of Place
- Sustainability
- Value Relationship with Maltster/Grower
- Others:
 - Operating a Farm Brewery, Wanted to Brew a Wet Hop Beer, Freshness of Ingredients

What Areas Need Improvement?

- **Price**
- **Consistency/Brewhouse performance**
- **Quality**
- **Variety**
- **Availability**
- **Access to Lot Information/Analytics**
- **Availability of Pelletized Hops**



Larger Brewers

- Quality and consistency must be high so beers will be repeatable
- Volumes needed often outpace available local supplies
- Local Hops are popular in Wet Hop beers
 - Founders Harvest Ale
 - Surly Wet
 - New Holland Hopivore





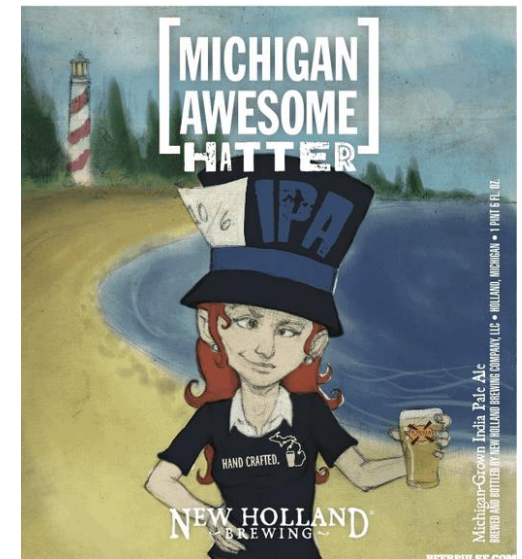
Small Brewers

- Needs can be more easily met with current supply
- Increased ability to “pilot” new products
- More room for experimentation
 - Not necessary to meet demands of distribution



Locally Sourced Beers

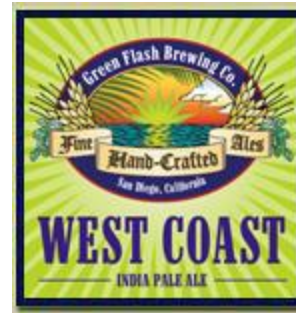
- Rockford Brewing Company
Paradigm MPA
 - Only year round beer in Michigan made with 100% Michigan grown malt and hops
- New Holland Michigan
Awesome Hatter
 - Uses Michigan grown malt and hops





Sense of Place

- Craft Brewers have already pushed localization through marketing
 - Naming and labels



- Is localized sourcing of ingredients an extension of this?





Future Outlook

- How mainstream will craft malt/local hops get?
- Can new hop growing markets help meet industry demand?
- Challenges for Growth
 - Climate can be inherently limiting
 - Heavy investments needed for large scale growth
 - Price, can it equalize with PNW & Europe?





Local Yeast

- Involves some legwork, but not impossible
- Culture it from nature
 - Damaged Fruit
 - Flowers with insect activity
 - Tree Sap
 - Bee Hives
 - Open air traps (lower success rate)
- March/April 2013 Zymurgy – Lots of tips





Local Yeast

- Small labs are on the forefront
- SouthYeast
 - Isolated more than 100 local cultures
 - Around 1/3 proven out and undergoing trials
 - 8 pure yeast strains and 3 bacteria offered
 - Native Farmhouse strain – NHC Final Round
 - Most are close relatives of *S. Cerevisiae*
 - *Bank Your Strain* program





Other Way to Source Locally

- Native ingredients unique to your region
 - Honey
 - Spruce
 - Etc
- Grow/Malt your own
 - Home hop growing
 - Micro Malting





Where can I buy it?

- Go straight to the source, get to know your local hop farmer or craft malt house
- Local homebrew shops
- Northern Brewer
 - Hop Head Farms
 - Pilot Malt House (soon!)





Takeaways

- Local sourcing is growing, and shows no signs of slowing
- Brewers and consumers care about sourcing local
- Quality, consistency, price are all a work in progress but are improving
- This industry is still very young
- The case for localization
 - Why do you support your local homebrew shop and neighborhood brewpub?

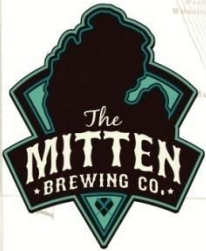


And now for a shameless plug...

THE MIPA SERIES

MADE WITH 100% MICHIGAN MALT, HOPS AND WATER

A LOCAL COLLABORATION BROUGHT TO YOU BY



Q&A