Ohio’s Newest Malting Facilities and Markets

By: Andrew Martahus of Haus Malts
### Variety Selection

- **Associations**
  - Canadian Malt Barley Technical Center (CMBTC)
  - American Malt Barley Association (AMBA)
  - Craft Malting Guild
  - Local malt house

- **Universities**
  - OSU
  - Cornell
  - Pennsylvania State
  - Michigan State
  - Predominate barley growing states (Oregon, Idaho, Montana, etc.)

#### Variety Selection Table

<table>
<thead>
<tr>
<th>Two-Rows</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAC Synergy</td>
<td>2015</td>
</tr>
<tr>
<td>ABI Voyager</td>
<td>2014</td>
</tr>
<tr>
<td>AC Metcalfe</td>
<td>2005</td>
</tr>
<tr>
<td>CDC Copeland</td>
<td>2007</td>
</tr>
<tr>
<td>CDC Meredith</td>
<td>2013</td>
</tr>
<tr>
<td>Charles*</td>
<td>2009</td>
</tr>
<tr>
<td>Conlon</td>
<td>2000</td>
</tr>
<tr>
<td>Conrad</td>
<td>2007</td>
</tr>
<tr>
<td>Endeavor*</td>
<td>2015</td>
</tr>
<tr>
<td>Expedition</td>
<td>2013</td>
</tr>
<tr>
<td>Harrington</td>
<td>1989</td>
</tr>
<tr>
<td>Hockett</td>
<td>2010</td>
</tr>
<tr>
<td>Merit</td>
<td>2000</td>
</tr>
<tr>
<td>Merit 57</td>
<td>2010</td>
</tr>
<tr>
<td>Moravian 37</td>
<td>2010</td>
</tr>
<tr>
<td>Moravian 69</td>
<td>2010</td>
</tr>
<tr>
<td>ND Genesis</td>
<td>2016</td>
</tr>
<tr>
<td>Pinnacle</td>
<td>2011</td>
</tr>
<tr>
<td>Scarlett</td>
<td>2008</td>
</tr>
<tr>
<td>Wintmalt*</td>
<td>2013</td>
</tr>
</tbody>
</table>

*Winter

#### Variety Selection Diagram

- **Six-Rows**
  - Celebration | 2011
  - Innovation | 2014
  - Lacy | 2000
  - Legacy | 2001
  - Quest | 2011
  - Stellar-ND | 2006
  - Thoroughbred* | 2015
  - Tradition | 2004

Variety name & year first recommended
2-Row vs 6-Row

- Most common with brewers and distillers
- Most malt barley varieties available are 2-Row
- Most newly developed varieties are 2-Row
- Concerns: Disease pressure, not bred for Ohio, and not many heritage varieties are available

- Somewhat common with distillers, used less with brewers
  - Due to higher diastic power
- Thoroughbred 6-Row is malted by Riverbend in Ashville as a heritage barley
- Maja available from Ohio Certified Seed
- Concerns: Higher protein, plumpness, thins, and brewer preference
Seed and Seeding

• Seed Sources
  • Ohio Certified Seed and other states
  • Seedway in New York,
  • references from associations and universities
  • OSU varieties

• Seeding
  • 2-2.5 bushels/acre
  • 1.5-1.75 inches deep
Soil Fertility and Fertilizer

- Barley (80 bu/acre) demand on soil
  - Uptake (lb/acre): 100-122 Nitrogen, 40-49 Phosphate, 96-117 Potassium, 12-14 Sulfur
  - Removal (lb/acre): 70-85 Nitrogen, 30-37 Phosphate, 23-28 Potassium, 6-8 Sulfur
- General Fertilization (lbs/acre)
  - 55-90 Nitrogen, 30-40 Phosphate, 15-30 Potassium, 15 Sulfur
  - We look for lower protein than feed, therefore later fertilizer applications are not recommended
Disease Control and Harvesting

• Disease
  • I will let the experts presenting later discuss
  • What effects all small grains will effect barley
    • Fusarium, smut, blackpoint, mildew, etc.

• Harvesting
  • Swathing after <30% moisture or combine at 16% moisture
  • If aerating you can start early
  • Below 13.5% can cause peeling and damage
  • No desiccants or pre-harvest glyphosates
Barley Selection Process

1. Representative Sample
2. Germination: 95% or greater
3. Protein: 9.5-12.5%
4. RVA/Falling Number: 135+/200+
5. Color: Lighter over Darker
6. Plumpness: 90% on 6/64
7. Moisture: Below 13%
8. Foreign Material: Dockage is taken for excessive weed seeds, straw, etc.

<table>
<thead>
<tr>
<th>Origin of selected samples</th>
<th>Prairie Provinces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop year</td>
<td>2015</td>
</tr>
<tr>
<td>Tonnage, thousands of tonnes</td>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Weight, Kg/ hL</td>
</tr>
<tr>
<td>1000 kernel weight, g</td>
</tr>
<tr>
<td>Plump, over 6/64&quot; sieve, %</td>
</tr>
<tr>
<td>Intermediate grade, over 5/64&quot;sieve, %</td>
</tr>
<tr>
<td>Moisture, %</td>
</tr>
<tr>
<td>Protein, %</td>
</tr>
<tr>
<td>Germination, 4 ml (3 day), %</td>
</tr>
<tr>
<td>Germination, 8 ml (3 day), %</td>
</tr>
</tbody>
</table>
9. Fusarium
   • Limited at 1ppm for human consumption, we prefer a buffer
   • Working with our seed cleaner to develop a procedure for removing high levels of DON/Fusarium to meet the 1ppm threshold
   • Adjusting combining methods can help
     • Lighter grain can be blown out with changes in the fan

10. Cleaning
   • Typically cleaned by size if there is a big assortment
     • 6/64, 5/64, 4/64 (for distillation)
     • We cleaned on a 5.5/64 slotted screen
What is Malting?

StEEP

Germination

Kilning
Which Grains can be Malted?

<table>
<thead>
<tr>
<th>Common</th>
<th>Uncommon</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Barley</td>
<td>• Corn</td>
</tr>
<tr>
<td>• Wheat</td>
<td>• Rice</td>
</tr>
<tr>
<td>• Spelt</td>
<td>• Millet</td>
</tr>
<tr>
<td>• Rye</td>
<td>• Buckwheat</td>
</tr>
<tr>
<td></td>
<td>• Quinoa</td>
</tr>
<tr>
<td></td>
<td>• Amaranth</td>
</tr>
<tr>
<td></td>
<td>• Triticale</td>
</tr>
<tr>
<td></td>
<td>• Oats</td>
</tr>
</tbody>
</table>
Availability of Grains in Ohio

• Commodities
  • Corn
  • Soft Red Wheat

• Contract Grown
  • Spelt
  • Rye
  • Specialty Wheat

• Ohio Barley
  • Historically grown in Ohio
  • OSU breeding program
    • Test plots
    • New varieties adapted for Ohio
  • Ohio Certified Seed
    • Maja
  • Haus Malts Contracts
    • 5 fields of winter barley
    • 2 fields of spring barley
Small Grain Farming

**Challenges**
1. Competition with Corn and Soybean
2. Growing rain and temperature
3. Disease pressure
4. Higher quality

**Benefits**
1. Double crop
2. Winter cover crop
3. Soil quality
4. Lower fertilization
5. Straw market
6. Relationship with buyer and end user
7. Natural manure on fall crop
Benefits to Us

• Sustainability
• Decrease transportation
• Keep $ in Ohio
• Control of varieties
• Personal relationships with farmers
• Transparency in supply chain
Farm to Malt – Quality Checkpoints

• Malt quality barley
  • Most Important: Protein, RVA/Falling Number, DON, Germination
  • Others: Weed seeds, Plumpness, Weathering, Moisture, etc.

• Seed cleaning
  • Uniform kernel size, removal of straw, foreign seeds

• Malting
  • Process control
  • Removal of rootlets and broken/undersized grain
  • Friability, moisture, and color
What Has Us Excited

• Access to different varieties
• Custom flavor profiles
• Ability to move quickly and respond to changes in local demand
• Freshness
• Unique grains
• Building a local supply chain
Progress of Haus Malts

• Initially finding farmers
  • Eric Stockinger, Brad Bergefurd, Ohio Seed Improvement Association, Great Lakes Brewing

• Farmers reaching out
  • Specialty crop, economics, winter cover crop, malting themselves

• Current Farms
  • Winter barley: 1 in Smithville, 2 in Pemberville, 2 in Spring Valley
    • Wintmalt and Scala
  • Spring barley: 1 in Trumbull County and 1 in Garretsville
    • TBD: Synergy, New Dale, Full Pint, etc.
Progress of Haus Malts Cont.

• 5th batch of malt bagged 2/9/2016
• Brewed at Nano Brew, Little Fish Brewing, Great Lakes Brewing, and more on the way
• Continuous improvements on our kiln, process control, and recipes
• Addition of another bin and pilot kiln
# Malt Houses in Ohio

<table>
<thead>
<tr>
<th>Malt House</th>
<th>Location</th>
<th>Batch Size</th>
<th>Malt Styles</th>
<th>Distribution Range</th>
<th>Production</th>
<th>Contact Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haus Malts</td>
<td>Cleveland</td>
<td>4,000 lbs per bin</td>
<td>Pilsner to dark Munich, smoked, and caramel</td>
<td>Delivery in Cleveland and shipment around Ohio</td>
<td>Started 12/2015</td>
<td>andrew@hausm alts.com or 216-570-1108</td>
</tr>
<tr>
<td>Little Miami Farms</td>
<td>Spring Valley</td>
<td>2,000 lbs (planned)</td>
<td>Base and custom</td>
<td>Cincinnati and Dayton</td>
<td>Planned to start Q3 2016</td>
<td>Jamie@littlemi ami farms.com or 937-532-9569</td>
</tr>
<tr>
<td>Ohio Malting Company</td>
<td>Wakeman</td>
<td>4,000 lbs (planned)</td>
<td>Base</td>
<td>N/A</td>
<td>March 1st, 2016</td>
<td><a href="mailto:ohiomaltingcompany@gmail.com">ohiomaltingcompany@gmail.com</a> or 440-774-9463</td>
</tr>
<tr>
<td>Rustic Brew Farm</td>
<td>Marysville</td>
<td>2,000 lbs (planned)</td>
<td>Pilsner to Pale Ale</td>
<td>Columbus and shipment in Ohio</td>
<td>Q1 2016</td>
<td><a href="mailto:Matt@RusticBrewFarm.com">Matt@RusticBrewFarm.com</a></td>
</tr>
<tr>
<td>Sweet Acres Malt</td>
<td>Goshen</td>
<td>2,000 lbs (planned)</td>
<td>Base</td>
<td>Cincinnati and Dayton</td>
<td>N/A</td>
<td><a href="mailto:camille29alexis@hotmail.com">camille29alexis@hotmail.com</a> or 513-763-0487</td>
</tr>
<tr>
<td>Nick Sheets (Proposed)</td>
<td>Columbus</td>
<td>4,000 lbs (planned)</td>
<td>Base</td>
<td>N/A</td>
<td>N/A</td>
<td><a href="mailto:Nick.sheets91@gmail.com">Nick.sheets91@gmail.com</a></td>
</tr>
</tbody>
</table>
Thanks for Listening

Q&A period after presentations