Yeast: Natural Tools for the Modern Winemaker

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Indiana Presentation 2009
Tools for Winemakers

• Yeast and Bacteria
• Enzymes
• Nutrients
• Tannins
• Fining
• Filtration
• Stabilization
A winemaker needs to be:

• Part Artist
• Part Craftsman
• Part Scientist
• Lucky
A winemaker’s customer wants a wine that:

- Taste and smells good
- Looks nice (good color and clarity)
- Is a good value
- Tastes like what it supposed to be
Use what techniques work best for local grapes and wine

- Tendency to use “famous” winemaker’s techniques
- Do trials correctly with a control
- Call on technical resources (manufacturer, universities etc.)
- Use the full tool set available
Would you build a house with just a hammer, saw and a screwdriver?

- Have a vision of what the wine should be
- Understand the nature of your grapes
- Choose your tools accordingly to get as close to the target as possible and minimize risks
- Use your whole tool set
Yeast as Tools:

• Turns sugars into alcohol
• Can add flavor and aroma (good and bad)
• Sanitize by removing nutrients used by other micro-organisms
• Need to be viable enough to finish fermentation
• Can help emphasize or add characteristics
What you need to know about yeast choice

- Indigenous vs. Selected strain
- Nutrition and physical conditions of must
  - pH, nitrogen, color, sanitation, temperature
- What kind of wine is your grapes really capable of producing
  - Varietal characteristics
  - Climatic/Terroir variation
“Indigenous” vs. Selected strain
Understanding the choice:

- Traditional or “old school” says that wild or indigenous yeast adds complexity
- Most yeast strains have various defects and problems
- Wild fermentations usually are a succession of yeast with the strongest finishing
- Indigenous strains rarely gain sufficient cell numbers
- Typically, the strains reflect what has been used prior
- Native bacteria compete for same nutrients
- Adds risk and unpredictability
“Indigenous” vs. Selected strain
Understanding the choice:

• Selected strains are collected from nature and rigorously tested for:
  – Strength under real world conditions
  – Production of undesirable products: H\textsubscript{2}S, VA, Biogenic Amines
  – Nutritional and temperature requirements
  – Capability of surviving drying process and re-animation

• New genetic testing allows for a much higher degree of understanding critical characteristics
  – Genes for H\textsubscript{2}S, Thiol conversion, Terpene release, Ester production, polysaccharide production etc.
New technology for yeast development:

- Genetically modifications (GMO) are possible but not currently acceptable by market
- Directed breeding allows faster and more confident selection of viable strains
Making good choices for yeast:

- Yeast used as a tool are like choosing which pastel colors you want to use—Subtle changes.
- Yeast can add:
  - Aromas
  - Flavors
  - Textures / Mouthfeel
  - Stability with lees aging
What do you want from your yeast strain?

• Understand what your grapes have to offer
  – White
    • Aroma precursors- Sauvignon blanc, Gewürztraminer
    • Low varietal character- Chardonnay
  – Red
    • Specific varietal characteristics
    • Thiness
    • Bitter or astringent

• Take time to read what characteristics yeast strains can supply
What can your yeast strain do for you?

• Yeast can add aroma characteristics:
  – Thiol conversion (grapefruit, tropical, grassy)
    • For varietals containing thiol precursors
      – Sauvignon blanc, Gewürztraminer, Traminette
      – Zymaflore VL-3 and X-5 have conversion genes
  – Terpene release (floral)
    • For varietals containing Terpenes
      – Riesling, Gewürztraminer, Traminette
      – Zymaflore VL-1 and Zymaflore X-5
  – Improved Mouthfeel- Polysaccharides etc.
    • Reds - Zymaflore RX 60, F-15
    • Whites Zymaflore VL– 3, X-5
What can your yeast strain do for you?

– Ester Formation (fruity or floral)
  • Cool fermentation temps (↓60º F)
    – Zymaflore VL-1, VL-2 and X-5
  • Low varietal or climactic characteristics
    – Chardonnay, Seyval, Vignole, Chardonel, Vidal
    – Zymaflore X-16, VL -1
  • Mask Vegetal Characteristics (bell pepper, tomato leaf)
    – Reds
    – Zymaflore FX 10

– Emphasize neutrality of variety
  • PDM, Actiflore B0213, Davis 522

– Survive difficult conditions and Restarts
  • High alcohol potential, low pH, low temp, or historically difficult fermentations
    – Actiflore B0213, PDM, Uvaferm 43
What yeast strains are not likely to do:

- Lower Alcohol levels
  - Little or no difference in strains
- Only GMO yeast can convert malic acid
- Know what kind of grape they are fermenting
- Ferment well at really cold temperatures
- Make a good wine from poor grapes
- Make an Indiana Cabernet taste like a Bordeaux Cabernet
What can you do for your yeast strain?

1. Understand nutritional status
   - Know nitrogen status - lowers H₂S risk
   - If nitrogen is low, thiamine is also low
   - Add both (Thiozote) after the first third of fermentation

2. Supply yeast with re-hydration nutrient
   - Dynastart is the most important thing you can do – improves survival and aroma production

3. Follow manufacturers instructions for re-hydration

4. Understand sanitary conditions
   - SO₂ addition

5. Ferment at a moderate temperature
What can you do for your wine?

1. Consider ML co-inoculation
   - In cold climate- use the heat of fermentation
   - Choose compatible yeast strain and ML strains
   - Don’t do if you have high risk fermentation

2. With known color problem grapes
   - Oak does not help with color
   - Choose a strain that is less color absorbent
     • Zymaflore RB2

3. To improve aroma retention in whites:
   - Protect from oxidation
   - BioArom addition (glutathione)
Thanks for your attention