2. My testimonial on coinoculation yeast - bacteria
- Coinoculation is part of my consulting good practices since 2006
- 3 of my consulting clients do coinoculation in all their reds
- One of them since 2007
- 100% of the Pinot Noir tanks are co-inoculated. Seven of my consulting clients are making Pinot Noir
The main arguments for coinoculation (the way my consulting clients perceive its advantages)

1. Sensory quality and consistency in style. The main and most original key point of coinoculation
2. The shorter MLF duration in wines that combine
   * intense pH change (to reach pH 3.5 or lower)
   * high alcohol potential (> 14%vol)
3. Microbial purity during and after the alcoholic fermentation, during and after the MLF
3. How to integrate a new technique into a winemaking strategy?
A strategy approach

1. Define market and style goals
2. Plan a winemaking and aging strategy
3. Apply a very precise procedure through vinification and aging
4. Monitor the conformity to defined goals with the right sensory and classical analysis
1. Define market and style goals

Which are the successful wines?
Wines that combine:

- clean and sound profile,
- conforming longevity,
- without perceived aggressivity
Without aggressivity

Conforming Wines

A

B

C

Wines that are Limit to conformity

Non Conforming Wines

Conforming longevity

Clean and sound

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Number 1 Axis: To build the right longevity

Note: in the next slides, the underlined words are related to MLF and coinoculation
With a colloidal matrix sufficiently concentrated, balanced and stabilized

1. The right pH in the juice and the wine: a very powerful motor for the colloidal balances, the most powerful

2. Sufficient concentration with macromolecules from grape, yeast, bacteria, oak

3. Right concentration with compounds that participate to different families of aromas and their right interactions with macromolecules. Often, interactions are more important for sensorial expression than the molecular concentration itself
Right concentration with compounds that participate to different families of aromas and their right interactions with macromolecules

1. Sulfur like aromas and tastes
2. Chemical and solvent like aromas and tastes
3. Herbaceous and vegetal like aromas and tastes
4. Fruits and spices like aromas and tastes
5. Burning, cooked and / or pharmaceutical like aromas and taste
Some important considerations

- Fruity and spicy like aromas and taste, balanced acidity, roundness and length can express and last (longevity) only if:
  - The other 4 aromatic families (sulfur, chemical, herbaceous, pharmaceutical) are:
    - at enough low molecular concentration
    - in enough intense interaction with macromolecules
  - The compounds that may participate to fruit and spicy like aromas are in enough intense interaction with macromolecules
Manage pH

- Tartaric acid immediately in the fresh grape
- Note: the most efficient and eliminate the potassium that is in excess
Take interesting macromolecules

- Enough maturity of grapes cells (cell walls, aromas, pigments, tannins interacting with grape polysaccharides) and enough maceration
- Right yeast strain and right inactive yeast at the right moment, including after membrane treatments
- Right lactic bacteria strain
- Right oak, at the right dosage, at the right moments, starting with fresh grapes
Do not eliminate interesting macromolecules

- Be careful with excessive maceration or oak for too much time: they destabilize interesting macromolecule complexes
- Be very careful with excessive finings
- DO NOT USE copper sulfate or copper citrate = fruit killers!
- Work with membrane as soon as possible: to early balance the wine and be able to start again aging with the right inactivate yeast and the right oak
2. Plan a winemaking and aging strategy to answer the style and market goals, including longevity
Winemaking goals and main risks management to reach the main market goals: A, B and C

- Taking fruit aromas from pulp and skin, pigments, polysaccharides from pulp and skin, hydrosoluble tannins from the skin
- Stabilizing those elements that are key points of the colloidal matrix
- Not extracting herbaceous aromas and aggressive tannins in the inner layers of the skin
- Extracting as few as possible ethanol soluble tannins.
Winemaking goals and main risks management to reach the main market goals: A, B and C (2)

- Avoiding sulfur like off odors: they amplify herbaceous and aggressive sensations on the nose and in mouth (metallic taste and bitterness).
  
  - The lowest efficient level of SO2 before fermentation
  - The right yeast strain, the right protection and nutrition during fermentation
  - The right oxygenation program during maceration
  - The right bacteria strain and right timing of inoculation
  - The right program of racking, agitation during aging
3. Apply a very precise procedure through vinification and aging

Some practical examples of consistency between market / style goals and winemaking, including coinoculation
Full bodied Cabernet with barrel aging
30 $ retail
72 month longevity

Note: this example is not the procedure used by Kellerei Bozen. It is a procedure to reach the target style with conforming grapes from Virginia
Fermentation strategy

Cubes, 500 g/hl, Fr., Convection toasted, 210°

Yeast = ICV-D254, 30 g/hl + GoFerm Protect, 30 g/hl + Fermaid O, 20 g/hl + OptiRed 30 g/hl

Co-inoculation with VP41 One Step

SO2: 2-3 g/hl. No more, we are going to talk soon about pH adjustment!

Fermaid K
30 g/hl

Noblesse
10 g/hl

Brix

Devating

2 Rackings

1 week
Maceration strategy

Destem, crush + Adjust pH at 3.45-3.50 (don’t care about Total Acidity)

Delestage + Lees elimination

Delestage

Destem, crush + Adjust pH at 3.45-3.50 (don’t care about Total Acidity)

Delestage + Lees elimination

Delestage + Lees elimination

Delestage + Lees elimination

Delestage

Delestage

Delestage

Delestage

Delestage

Devating

2 Rackings

1 week

Maceration Enzymes

e.g. Lallzyme

EX-V

3 g/hl

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Strategy with agitations and rackings around malolactic

- Staves, 300 g/hl, Fr. M+
- Tartaric for pH 3.5 + 50 ppm SO2
- Noblesse 10 g/hl
- Agitation: 2 rackings
- Keep 0.7 mg/L molecular SO2
- 64°F
- Second racking after draining
- Noblesse 20 g/hl
- End of malic
- Back to staves
- 2 rackings
- Rack to barrels*
- Commercial use prohibited (training, copy, articles, marketing material, etc..) without written consent of Dominique Delteil
Micro-oxygenation

Staves, 300 g/hl, Fr. M+

64°F

1 week

Agitation

10 mg/L/Month

Tartaric for pH 3.5 + 50 ppm SO2

Noblesse 10 g/hl

Keep 0.7 mg/L molecular SO2

2 mg/L/Month

Back to staves

Second racking after draining

Noblesse 20 g/hl

End of malic

2 rackings

Rack to barrels*

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Monitoring spoilage population

Staves, 300 g/hl, Fr. M+
64°F
1 week

Second racking after draining

Noblesse 20 g/hl

2 rackings

End of malic

Back to staves

Rack to barrels*

Agitation

Noblesse 10 g/hl

2 rackings

Tartaric for pH 3.5 + 50 ppm SO₂

Back to staves

Noblesse 20 g/hl

End of malic

Back to barrels*

SO₂

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Long term advantages to manage spoilage level in your barrel cellar

- Your barrels only touch a wine with very low spoilage level and high stable molecular SO2
  - Lower level of spoilage bacteria and yeast
    - Lower spoilage population at the end of MLF when SO2 is added, due to coinoculation
    - Better sanitation efficiency of SO2 on a lower spoilage population
  - Better stability of the molecular SO2:
    - adjusted pH before sulfiting,
    - right SO2 addition in function of pH,
    - very few combining heavy lees (4 rackings)
Why MLF in barrel is not such a key technique for balanced wines and longevity? (1/2)

• Higher spoilage risks than the proposed procedure
• Higher risks of sulfur like off flavors: more difficult to manage 100 barrels than just 1 or 2 tanks with the right staves, right active lees (Noblesse), right agitation, right temperature, right micro-oxygenation
• Not easy to adjust the level of heavy lees before MLF and during MLF if needed
Why MLF in barrel is not such a key technique for balanced wines and longevity? (2/2)

- Not possible to make a precise micro-oxygenation before and during active MLF
- Obligation to add a high quantity of SO2 into the barrels, in order to kill the selected LAB population with only one shot
- Wine-barrel balance is easy to reach quickly with the proposed program: the wine prepared with staves+Noblesse is not an aggressive extractor on the barrel oak
Continue to work building the colloidal matrix and the longevity

- TH2? + SO2?
- Noblesse 10 g/hl
- Noblesse 5 g/hl

1 Month

Rack

24 hours
Monitoring spoilage population

- Batonnage
- 1 Month
- Rack
- 24 hours
- Lblesse 5 g/hl
- 1 Month
Full bodied Pinot Noir with barrel aging
35 $ retail
72 month longevity

Note: this example is not the exact procedure used by Kellerei Girlan. It is a procedure to reach the target style with conforming grapes from Virginia
Fermentation strategy for a Ultra Premium Pinot Noir

- **Yeast** = Lalvin RC212 or ICV D21, 30 g/hl + 30 g/hl GoFerm Protect

- **Coinoculation with VP41 One Step**

- **Fermaid K** 30 g/hl

- **OptiRed** 30 g/hl

- **Fermaid O** 20 g/hl (if >14% vol.)

- **Noblesse** 10 g/hl

- **Fermaid** O 20 g/hl (if >14% vol.)

- **Cubes, 700 g/hl, Fr., Convection toasted, 210°**

- **Drain**

- **Rack**

1 week
SO2: 2-3 g/hl. No more, we are going to talk soon about pH adjustment!
Strategy of maceration

Destem, Crush, cool grapes + Adjust pH to 3.30 (don’t care about Total Acidity)

Delestage + lees elimination

Maceration enzymes
Lallzyme EX-V

+ CO2

1 week

Drain

Rack
Strategy of oxygenation

Oxygen: 3 x 2 mg/L
Oxygen: 3 x 3 mg/L
Oxygen: 3 x 3 mg/L
Oxygen: 3 x 3 mg/L
Oxygen: 3 x 2 mg/L

End of oxygenation

Oxygen: 2-3 mg/L/day
Continuous

CO2

Drain

Rack
Strategy with agitations and rackings around malolactic

Staves, 400 g/hl, Fr. M+

1 week

64°F

Agitation

Noblesse 20 g/hl

Second racking after draining

End of malic

Tartaric for pH 3.3 + 30 ppm SO2

Noblesse 10 g/hl

Keep 0.7 mg/L molecular SO2

2 rackings

Back to staves

Rack to barrels

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Staves, 400 g/hl, Fr. M+

64°F

Micro-oxygenation

1 week

2 rackings

End of malic

Noblesse 20 g/hl

Second racking after draining

Noblesse 10 g/hl

Agitation

Tartaric for pH 3.3 + 30 ppm SO2

Rack to barrels

Rack to staves

End of malic

0 mg/L/Month

0 mg/L/Month

0 mg/L/Month

Keep 0.7 mg/L molecular SO2

64°F

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Monitoring spoilage population

- **Agitation**
- **1 week**
- **64°F**
- **Noblesse 20 g/hl**
- **Second racking after draining**
- **Tartaric for pH 3.3 + 30 ppm SO2**
- **2 rackings**
- **End of malic**
- **Back to staves**
- **Rack to barrels**
- **Staves, 400 g/hl, Fr. M+**

Keep 0.7 mg/L molecular SO2
Continue to work building the colloidal matrix and the longevity

Batonnage

TH2? + SO2?

Noblesse 10 g/hl

Noblesse 5 g/hl

1 Month

24 hours

Rack

Staves, 50 g/hl, Fr., CT, 210°C

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Monitoring spoilage population

1 Month Monitoring spoilage population

Batonnage

loblesse 5 g/hl

Rack

24 hours

Staves, 50 g/hl, Fr., CT, 210°C