Winemaking Good Practices to build a Pinot Noir
Fruity, balanced, with a conforming longevity, to reach market segment goals

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1. Which are the successful wines?
Non Conforming Wines

Wines that are Limit to conformity

Conforming Wines

Without aggressivity

Clean and sound

Conforming longevity
Number 1 Axis: To build the right longevity
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 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
- Don’t listen to trendy talks about malic and lactic...
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
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.
Other interesting axis (1)

- Eliminate potassium (and calcium) as soon as possible: pH membranes, resins or electrodialysis
- Absorption, as soon as possible, of compounds that participate to defects (sulfur, herbaceous, chemical, cooked-pharmaceutical) : for example Noblesse with segmented fractionated additions, starting early during vinification and aging
Other interesting axis (2)

Avoid the 4 mistakes of micro-oxygenation:
1. Too much oxygen
2. Too much time
3. Too late during the life of wine
4. Too much contamination
2. Vinification Strategy
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
- 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 protection and nutrition of the yeast during fermentation
  - The right oxygenation program during maceration
  - The right program of racking, agitation during aging
A simple proof to demonstrate that yeast may have an impact on color stabilization.

Vintage: 1997
Photo: 2004

From: ICV Internet site
www.icv.fr
Full bodied Pinot Noir with malo in barrel and barrel aging

To reach a classical top burgundy style with excellent grapes from outside Bourgogne: shining red color, clean graphite/licorice/black plum fresh jam aromas, intense fresh mid palate with present acidity, long fresh and mineral finish. Real minerality!
Temperature management with Cold Prefermentative Maceration

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

GoFerm Protect 40 g/hl

OptiRed 30 g/hl

Lactic Bacteria. VP41 One Step + Fermaid O 20 g/hl (if >14% vol.)

Fermaid K 30 g/hl

Noblesse 10 g/hl

Lalvin RC212 at 30 g/hl

Drain

Rack

1 week

Adjust pH to 3.30 (don’t care about Total Acidity)

Reduless, if needed 1 g/hl.

Not more at this stage

On grapes: “hl” = 100 kg
On juice and wine: “hl” = 100 L

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On juice and wine: “hl” = 100 L

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OptiRed® in action on the colloidal matrix

Before

Anthocyanins exposed to instability reactions
OptiRed® in action on the colloidal matrix

During

OptiRed colloids

OptiRed colloids

OptiRed colloids
OptiRed® in action on the colloidal matrix

After

OptiRed colloids

Stabilized pigments
Délestage can be started as soon as the cap is formed. Délestage is also interesting during cold soak to eliminate the mud coming from rehydrated dust that was on the grapes (without air addition).

Best délestage is made with gravity, flushing the maceration tank juice towards the reception tank.

Best délestage is made without oxygen. Oxygen being precisely added to the maceration tank with a precise macro-oxigenator.

Délestage. Preparation
Maceration tank is completely drained to the reception tank

Délestage. Step #1

Notes:
1= yeast and mud at the bottom of the tank
2= fermenting juice not in contact with the pomace
3= pigment and tannins concentrated juice below the pomace: low extraction, low stabilization
4= juice bathing the pomace
5= emerged pomace: no juice contact

Note: An open jet in a bucket allows a true juice oxygenation: 2 to 4 mg/liter dissolved oxygen. Not recommended when a precise macrooxigenator is used.
Délestage. Step #1 (cont.)

Complete draining of the first tank is a key point of délestage. The most concentrated juice (the juice just below the cap) is renewed. A pumping over does not renew this juice. A punching down renews it also but is not doing délestage step 2.
Délestage. Step #2

Complete draining of the cap achieves the diffusion goals: extracts the most interesting grape macromolecules.
The return of the juice is done with high flow and low pressure (flooding), to avoid mechanical action on the cap. It is not necessary to look for a complete cap bathing.
When the cap stays together, it percolates through the juice or the wine. In other situations, it « melts » in the juice giving also excellent juice / cap exchanges, without violent extractions.
Strategy of maceration

Destem, Crush*, cool grapes + Adjust pH to 3,30 (don’t care about Total Acidity)

500-700 g/hl Chips, French, toasted Medium +

Delestage + 2-3 punching down + lees elimination

Delestage + 2-3 p.d + lees elimination

Delestage + 2-3 p.d + lees elim.

Del. + 2-3 p.d + seeds elimination

Del. + 2 p.d + seeds elim.

Del. + 2 p.d + seeds elim.

*Crushing is a key point in early diffusion of the best grapes elements. It is compulsory when it comes to extended maceration to avoid sugar leaking when selected yeast are dead
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

End of oxygenation

Drain

Rack

CO2

Oxygen: 2-3 mg/L/day
Continuous until dryness
Agitation: a key action in red winemaking

**Notes:**
1= yeast at the bottom of the tank
2= fermenting juice not in contact with the pomace
3= pigment and tannins concentrated juice below the pomace: low extraction, low stabilization
4= juice bathing the pomace
5= emerged pomace: no juice contact
Strategy of agitation

Agitation

Agitation

Agitation

Agitation

Agitation

Agitation

Drain

Rack

1 week
Strategy of temperature with Pinot Noir: with shorter maceration

SO2: 2-3 g/hl.

- 1 week at 10-12°C
- 20°C
- 18°C

Drain

Rack

Rack
Aging
Strategy with agitations and rackings around malolactic

1 week

Strategy:

- Noblesse 10 g/hl
- 2 rackings*
- In the barriques: Tartaric to reach pH 3.35 + SO2, 4 g/hl
- 1 batonnage a day for 3 days. Rack
- Keep 0.7 mg/L molecular SO2

16°C

Second racking after draining

*Pump wine and all lees to a tank. 24 hours settling. Rack to another tank for homogeneity. Analysis of the lot. Rack back to barrels 12 hours later

Back to barrels <12°C
Doses of SO2 at the very end of malolactic

<table>
<thead>
<tr>
<th>pH</th>
<th>SO2 added</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,30</td>
<td>3 g/hl</td>
</tr>
<tr>
<td>3,40</td>
<td>4 g/hl</td>
</tr>
<tr>
<td>3,50</td>
<td>5 g/hl</td>
</tr>
</tbody>
</table>
Continue to work building the colloidal matrix and the longevity

Batonnage

TH2 + SO2 if necessary

Noblesse 10 g/hl

Noblesse 5 g/hl

<12°C

Keep 0.7 mg/L molecular SO2

*Pump wine and all lees to a tank. 24 hours settling. Rack to another tank for homogeneity. Analysis of the lot. Rack back to barrels 12 hours later. Generally, after this racking, no other racking is necessary until the end of barrel aging. Nevertheless, at least once a month, check if racking, Noblesse addition (5g/hl) are necessary or not. Generally after 4-6 month in barriques, batonnage is made on a 3 month period basis.

Note: with those rackings, all made 24 hours after a batonnage, more than 90% of yeast and bacteria cells are kept in the wine for lees aging. Only negative heavy lees are eliminated at key moments.
The best moment to make a research on *Brettanomyces, Pediococcus, Lactobacillus* and *Oenococcus* living cells is during the racking made one month after the “malolactic racking”.
General procedure when the wine is taken from the barriques to a stainless steel tank

- Rack, pumping all the lees
- TH2 + SO2 if necessary 48 hours
- Crossflow filtration?
- Staves, 30-40 g/hl, French, Convection Toasted, 210°C
- Noblesse 10 g/hl
- 12-15°C
- Staves and Noblesse are buffering the negative electrostatic and tensio-active effects of stainless steel tanks
- Keep 0.7 mg/L molecular SO2
- Electrodialysis?
Full bodied Pinot Noir
with tank + staves malo
and
barrel aging

According to barrel aging length, 2 possible styles:

- Top Santa Barbara (California, USA) with 3-6 month barrel aging,
or
- Top classical burgundy with 12-15 month barrel aging

With excellent grapes from outside Santa Barbara or Bourgogne
Temperature management with Cold Prefermentative Maceration

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

1 week

20°C

18°C

10°C

Drain

Rack
Yeast protection and nutrition strategy

- **GoFerm Protect**
  - 40 g/hl

- **OptiRed**
  - 30 g/hl

- **Lactic Bacteria. VP41 One Step**
  - Fermaid O 20 g/hl (if >14% vol.)

- **Fermaid K**
  - 30 g/hl

- **Noblesse**
  - 10 g/hl

- **Lalvin RC212**
  - or
  - **ICV D21**
  - or
  - **Cross Evolution**

- **Reduless?**
  - 1 g/hl
  - Not more at this stage

- **Drain**
- **Rack**

On grapes: “hl” = 100 kg
On juice and wine: “hl” = 100 L

1 week
Strategy of maceration

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

500-700 g/hl Chips, French, toasted Medium +

Maceration enzymes
Lallzyme EX-V

Delestage + lees elimination
Delestage + lees elimination
Delestage + lees elim.
Del. + seeds elimination
Del. + seeds elim.
Del. + seeds elim.

2 to 3 punching down a day all through maceration

1 week

Drain

Rack
Strategy of oxygenation

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

Oxygen: 2-3 mg/L/day Continuous until dryness

End of oxygenation

CO2

Drain
Rack
Strategy of agitation

1 week
Strategy of temperature with Pinot Noir: with shorter maceration

SO2: 2-3 g/hl,

1 week

10-12°C

20°C

18°C

Rack

Rack

Drain
Aging
Strategy with agitations and rackings around malolactic

- **Tartaric for pH 3.35 + 30 ppm SO2**
- **Noblesse 10 g/hl**
- **Keep 0.7 mg/L molecular SO2**

- **Agitation**
- **16°C**
- **1 week**
- **Noblesse 20 g/hl**
- **2 rackings**
- **Back to staves**
- **Second racking after draining**
- **Rack to barrels**

**End of malic**

Staves, 400 g/hl, Fr. M+
Micro-oxygenation

Staves, 400 g/hl, Fr. M+

16°C

1 week

Noblesse 20 g/hl

Second racking after draining

Agitation

0 mg/L/Month

Tartaric for pH 3.35 + 30 ppm SO2

Keep 0.7 mg/L molecular SO2

Noblesse 10 g/hl

End of malic

2 rackings

Back to staves

Rack to barrels

0 mg/L/Month

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Monitoring spoilage population

- Tartaric for pH 3.35 + 30 ppm SO2
- Keep 0.7 mg/L molecular SO2

1 week Agitation

- Staves, 400 g/hl, Fr. M+
- Noblesse 20 g/hl
- End of malic

16°C

2 rackings

- Second racking after draining
- Back to staves
- Rack to barrels
Continue to work building the colloidal matrix and the longevity

Keep 0.7 mg/L molecular SO2

Batonnage

TH2? + SO2?

Noblesse 10 g/hl

Noblesse 5 g/hl

1 Month

Rack

24 hours

Staves, 50 g/hl, Fr., CT, 210°C

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Monitoring spoilage population

- Batonnage
- 1 Month
- Rack
- 24 hours
- Noblesse
- 5 g/hl
- 1 Month
- Staves, 50 g/hl, Fr., CT, 210°C

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Co-inoculation: 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 tank+staves 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 if needed (not for Pinot Noir, in general)
- 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, if needed
- 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
General procedure when the wine is taken from the barriques to a stainless steel tank

- **Rack**, pumping all the lees
- **TH2 + SO2** if necessary 48 hours
- **Crossflow filtration?**
- **Staves, 30-40 g/hl, French, Convection Toasted, 210°C**
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- **Electrodialysis?**
- **Keep 0.7 mg/L molecular SO2**

Staves and Noblesse are buffering the negative electrostatic and tensio-active effects of stainless steel tanks.