

## Chapter 9

### Red and Rosé Winemaking

To note:

1. Extraction of colour/tannins is key.
2. Pressing happens after fermentation, not before for red wines
3. MLF standard practice

### Crushed fruit fermentation

#### Pre-fermentation extraction

- **Cold maceration/cold soaking = grape macerate in low temp before fermentation**
  - Extract colour/flavour
  - Not tannins = more soluble in alcohol

#### Temperature control during fermentation

- **20-32°C**
- Care to not exceed 35°C and kill yeast
- To get colour/flavour/tannin
- **WM can reduce tannin extraction by lowering temp towards end of fermentation**

#### Cap management techniques

- To extract colour, flavour, tannins
- Controlled by number of times done/duration each day
  - **Punching down**
    - Mechanical paddles punch down cap
    - **Careful not to be too vigorous, esp at end of fermentation when tannins easier to extract**
  - **Pumping over**
    - Pump juice over from bottom of vat
    - Dissipates heat + oxygenates juice (good)
  - **Rack and return**
    - **Juice drained from fermenting vessel into another, then pumped back over cap**
    - Occurs once/twice during fermentation
  - **Rotary fermenters**
    - **Fermentation is rotating horizontal tanks**
    - Juice in constant contact with skins



### Fermentation vessels

- Fermentation in large vessels/open-topped (stainless/inert)
- **Impossible to ferment in barrel**

### Post-fermentation extraction

- **Maceration after fermentation = further extraction/smoothing of tannins**
- Some WM choose to keep contact long time to create smoother tannin structure

### Press wine

- **Free run wine drained from skins - remaining mass pressed**
- **Press wine may be deeper in colour/higher in tannin**
- WM may separate wine at different stages of press = 'press fractions'
  - Can be used to adjust colour/tannin in final blend

### Whole bunch fermentation

- Some WM use some or whole grape bunches
  - If whole, tannins must be ripe - or bitter tannic flavour occurs
- **Objective: To create an oxygen-free environment for fruit. So**
  1. The **berries create some alcohol in their own cells**, without the involvement of yeast = '**intracellular fermentation**'
  2. **Distinctive fruity aromas** created inside the berry - unique qualities

Three forms of whole bunch fermentation:

#### ● **Carbonic maceration**

- Whole, uncrushed berries put into **vat of CO<sub>2</sub>**
- Oxygen removed - **intracellular fermentation starts**
- **When alcohol reaches 2% - grapes split and release juice**
- Grapes pressed to separate juice from skins
- Yeast completes fermentation of skins
- **Result: Extracts colour, not tannin. Kirsch/banana/bubblegum/cinnamon flavour.**

#### ● **Semi-carbonic maceration**

- Unlike carbonic maceration, vats not filled with CO<sub>2</sub>
- Whole grape bunches added - **grapes at bottom crushed by those above - juice released.**
- **Ambient yeast starts fermentation**
- **CO<sub>2</sub> fills vat - remaining grapes undergo carbonic maceration**

- **Intact grapes, release juice - pressed and yeast complete fermentation**
- Some Pinot Noir made this way - though alcoholic fermentation still continues on the skins.
  - **Punching down** over first few days
  - **Carbonic maceration decreases until all grapes broken up**
  - Alcoholic fermentation continues on skins - followed by post-fermentation maceration
- **Result: Better integrations/fresher fruit character**
- **Whole bunches with crushed fruit**
  - **Whole bunches submerged under crushed grapes**
  - Not CO<sub>2</sub> blanketed, but **oxygen free while submerged = intracellular fermentation takes place**
  - **Whole bunches crushed under cap**
  - More 'carbonic' characteristics possible by adding more whole bunches
  - **Result: Wine with silky texture, brighter + fresher fruit.**

### Maturation options

- All reds undergo MLF
- Trend of small, new oak declining
- Premium wines - generally more oak aging

### Blending

- Different press fractions - free run wine blended often for colour, tannin, acidity and flavour
- Complexity - blending wines matures in oak vessels of different ages, sizes, toasting levels.
- More subtle - blend wines matured in oak with wine matured in stainless steel/concrete

### Clarification and Stabilisation

- Most reds undergo fining and/or filtration for clarity/stability
  - Some WM choose not to - believe it harms wine's structure
- Natural sediment occurs with long-term aging

### Producing High-Volume, Inexpensive Red Wines

- Climate: warm, dry sunny
- Varieties: Cab Sauv, Merlot, Syrah/Shira, Grenache/Garnacha - (fruity, good colour)



- Less intense, complex, tannins than premium versions
- Can seem homogenous
- Pinot Noir - not suited for high volume
  - Cool climate, difficult to extract tannin/colour/not high enough yields
- Labelled 'fruity reds' if blended/inexpensive

### Winemaking choices

- Handled carefully - SO<sub>2</sub> monitored
- Destemmed/crushed on arrival
- Hot climate = **tartaric acid may be needed to raise acid**
- Pre-maceration may occur, but also takes up space - not possible in high throughput winery
- **Commercial yeast - 22°-25°c** - fermentation temperature - fresh fruit flavours
- Cap not heavily worked
- Post-fermentation maceration - unlikely = vat space + additional unwanted tannins
  - Sometimes WM blends small portion of macerated wine
- Fruity/low-tannin - semi or full CM - inexpensive wines made from Grenache/Gamay (cheap Beaujolais)
- Maturation
  - Stainless steel - fruit flavours
  - Oak - smooth tannins/toast/spice
    - Only months - 2/3rd use barrels
  - Oak staves/chips - quick toasty flavours
- Consumers want clear wines; stabilised, fined and sterile filtered before bottling
- Short shelf life - SO<sub>2</sub> topped up to prevent oxidation

## Producing Premium Red Wines

### Cabernet Sauvignon

- Thick skinned = more colour, flavour, tannin
- **Late ripening** - cool regions, struggles to ripen. Poor weather = astringent tannins/herbaceous
- Haut-Medoc, Bordeaux
  - Young = grippy tannins, cedar, blackcurrant leaf
  - Age = tannins softer/more expressive
  - Blend with Merlot for fruit, smooth texture.
- In Europe, Cab Sauv. and Tempranillo (Spain), Cab Sauv and Sangiovese (Italy)
- Out of Europe, Cab Sauv - warm, sunshine = full-bodied, ripe blackcurrant, black cherry

- Napa Valley (California)/ Coonawarra, Margaret River (Aus.)/ Hawke's Bay (NZ)/ Stellenbosch (SA)/ Colchagua Valley (Chile)
- In winery - destemmed/crushed (no whole bunches - stems add herbaceous/astringent character)
- WM may pre-macerate = thick skin means more colour
- Ferm temp - **26°-30°c** - warm enough for extraction of colour/cool enough for fresh fruit flavours
- Cab Sauv - high tannin - high temp + cap management techniques avoided at end of fermentation
- Post-fermentation maceration to soften existing tannins/more gentle tannins
- Maturation - oak well suited
  - New oak used - not overpowering
  - French oak - 225-litre barriques most popular
  - 6 month - 4 years (12-18 months average)
- Blended to soften tannins (ie, with Merlot)

### Merlot

- **Buds and flowers earlier than Cab. Sauv.**
- 2 styles:
  - Harvested late as possible - maximum dark purple colour, blackberry/plum flavours, soft, velvet tannins (New World/ S of France/ some Bordeaux).
  - Harvested earlier - medium body, medium alcohol, higher acidity, fresh red fruit, leafy vegetal aromas (Bordeaux)
- Similar techniques to Cab Sauv
- Pre-fermentation maceration - greater colour/flavour if desired. Supple skins = less rigorous extraction.
- Oak maturation used (average 12-18 months)

### Pinot Noir

- **Early budding and early ripening (thin skin)**
- Varying clones
- Colour/tannin tricky to extract - maximise extraction without overworking the juice
- Cool climates → risk of not fully ripening (cabbage/wet leaves taste)
  - Burgundy (Cote d'Or) - intensity/complex. Floral → tannic/spicy.
  - Baden (Germany)/Los Carneros, Sonoma (US)/ Martinborough, Marlborough, Central Otago (NZ)/ Yarra Valley, Mornington Peninsula, Tasmania (Aus)/ Walker Bay (SA), Casablanca Valley (Chile).



- Too hot climate - Jammy/unattractive flavour
- In winery - destem/crush
- Pre-fermentation maceration - colour/tannin
- Some WM include whole bunches (enhances red fruit - becoming more popular)
  - Whole bunches crushed by punch down → fermentation continues on skins when broken
- Temp- +30°C - cooler (fresher style) or warmer (more colour/tannin)
- Post-fermentation maturation **not** widely practised
- Maturation
  - Oak (2nd/3rd used barrels or small proportion new oak) - 12-24 months
  - Not often blended with other varieties - might be blended with PN from other plots, or different treatments
  - Forest floor/mushroom in bottle

### Syrah/Shiraz

- Small, thick, dark colour grape
- From med-body, pepper, fresh black fruit → smooth, full body, ripe black fruit, liquorice
- Northern Rhone (coolest climate) for Syrah.
  - Lesser sites - grippy tannin/simple black fruit/lighter style
  - Cote Rotie/Hermitage - fuller body/berry/black pepper/meat/leather
- Languedoc/Roussillon - blended with Grenache/Mourvèdre/Carignan/Cinsault. Warmer climate = riper tannin/flavour
- In New World - Australia (Shiraz)
  - Hot region (Hunter Valley/Barossa Valley) - soft, earthy, spicy, black fruit
  - Cooler regions (Great Southern/Geelong/Heathcote) - learner/more peppery
- Chile/Hawke's Bay/Washington State - also grow Shiraz
- As it's higher alcohol - more vigorous cap management for maximum colour, flavour, tannin
- Toast - new oak
- Can harvest early for restrained style, gentler cap management. Extended post-fermentation maceration for fine tannin.
  - Restrained = older oak, 300-500-litre barrels

### Grenache/Garnacha

- **Late ripening - needs to be planted in warm/hot climates** (drought tolerant)
- Sweet, thin skinned grape → high alcohol, low acid, full body, soft tannin, red fruit
- Spain (Garnacha)
  - Priorat (blended with Carignan) - deep coloured wines, high tannin, fresh black fruit, toasty oak.

- Rioja Baja (blended with Tempranillo) - adds perfume, body, alcohol. Also Calatayud/Carinena/Navarra (also rosé)
- Southern Rhone (Grenache)
  - Chateauneuf-du-pape (blended with Syrah/Mouvedre) - full body, rich texture, spicy red fruit.
- Languedoc/Rousillon (blended with Syrah/Mouvedre/Carignan/Cinsault) - spicy, perfume, local herbs
- Australia - Barossa Valley/McClaren Vale - more restrained now/less full body. Old bush vines - concentrated fruit - ripe red berries/pepper spice.
- In winery - destemmed/crushed
- Pre-fermentation maceration common → flavour/colour - before alcohol levels rise in fermentation
- Some WM retain whole bunches
- Fermentation - open-top containers (stainless/cement) or rare old oak
- Gentle cap management (premium wines) - punching down
- Post-fermentation maceration if WM wants more tannic structure
- Drained off skins end of fermentation - usual
- Matured in large vessels (foudres)
- Usually blended. Hot climate - Carignan/mourvedre - adds fresher fruit/tannin/colour to the blend.

### rosé winemaking

#### **1. Direct Pressing**

- Grapes crushed/pressed same way as white production
- Extracts little colour (not too much tannin)
- Most delicate rosés

#### **2. Short Maceration**

- Crushed - macerate (extract flavour/colour)
- Maceration time - up to WM - may be up until start of fermentation
- Free run juice drained from skins - fermentation same temp as white

#### **3. Blending**

- Red wine blended with white. Only allowed for rosé champagne. Some new world production.