Chapter 9
Red and Rosé Winemaking

Vinspiration

Important to note:

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 CO2**
    - 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 CO2
    - Whole grape bunches added - **grapes at bottom crushed by those above - juice released.**

    - **Ambient yeast starts fermentation**
    - **CO2 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 CO2 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

<u>Clarification and Stablisation</u>

- 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 - SO2 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; stablised, fined and sterile filtered before bottling
- Short shelf life - SO2 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/simply 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.

Rose 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.

Multiple Choice Practice Questions

1) What is the primary purpose of cap management during red wine fermentation?

a) To add sweetness to the wine
b) To extract colour, tannins, and flavour compounds
c) To cool the fermentation temperature
d) To reduce acidity

2) In which region is blending red and white wines allowed in the production of rosé?

a) Chile
b) Provence
c) Bordeaux
d) Champagne

3) What is the purpose of lowering the temperature at the end of the fermentation period during red winemaking?

a) Reduce tannin extraction
b) Increase tannins
c) Increase acidity
d) Increase colour

4) What is the primary reason for using cold soaking (cold maceration) in red winemaking?

a) To accelerate fermentation
b) To increase alcohol content
c) To enhance colour and aroma extraction
d) To soften tannins

5) Which of the following describes the process of rack and return?

a) Draining the fermenting juice off the skins and then returning it to the tank
b) Stirring the lees during aging
c) Removing sediment from the wine by filtration
d) Allowing the cap to rise naturally during fermentation

Answers

1. b) To extract colour, tannins, and flavour compounds

2. d) Champagne

3. a) Reduce tannin extraction

4. c) To enhance colour and aroma extraction

5. a) Draining the fermenting juice off the skins and then returning it to the tank