

# WHITE & ROSÉ WINEMAKING WITH UNDERRIPE FRUIT

## RECOMMENDATIONS

### UNDERRIPE FRUIT MANAGEMENT STRATEGY

Among the many factors that influence grape ripeness are cultivar, vineyard management practices, climate and weather, soil, and the overall health of the vine. Other factors that may affect picking decisions are disease incidence, berry damage by birds, insects and animals, current and potential weather conditions, and logistics. At a minimum, ripeness assessment can be based on the sugar:acid balance and the phenolic maturity of the grapes. In some circumstances, we may have to harvest before the grapes have reached the desired maturity. When dealing with underripe fruit or grapes that taste vegetal due to the level of pyrazines and aldehydes, alternative and/or additional winemaking practices may be needed. Unripe fruit can result in limited extractability of the skin tannins due to thicker berry skins. It may also result in unripe seed tannins, lighter color, unbalanced mouthfeel, and diminished aromatic potential. The berry chemistry may also pose a challenge. The organic acid profile may affect fermentation choices. In underripe grapes, the YAN may not be sufficient to conduct a healthy and secure fermentation.



### TIPS FOR DEALING WITH UNDERRIPE GRAPES

- Analysis is key!
  - Pre-fermentation analysis (chemical and microbiological) allows you to make good winemaking decisions
  - Conduct a berry sensory assessment and evaluate fruit condition
- Eliminate MOG (material other than grapes)
- Sort the fruit and separate to different lots if necessary
- Treat the fruit gently throughout the process
- Eliminate the grape solids quickly
- Ferment at a temperature that produces fruity secondary metabolites
- Avoid using DAP as that will diminish the production of fruity flavors, and can promote the production of volatile sulfur compounds which will heighten the green flavors
- Choose yeast and bacteria that optimize fruity flavors
- Manage acid profile
- Mix the tank during the later stages of fermentation to keep the yeast in suspension

LalVigne® can help if underripe fruit is common in certain vineyard blocks.

## BERRY SENSORY ANALYSIS

Conducting a rigorous berry sensory assessment helps to overcome variability in the vineyard, and lets you evaluate the fruit prior to its arrival at the winery.

The ICV method of berry sensory evaluation was developed by Jacques Rousseau and has been adopted globally.

This method evaluates berries from 4 perspectives.

1. Visual and tactile sensations
  - a. Evaluate color, berry firmness and ease of stalk removal
2. Pulp assessment
  - a. Determines pulp firmness and adhesion to skin, sweetness, acidity and flavor (herbaceousness/fruity)
3. Skin tasting/maturity
  - a. Crushability, acidity, tannic intensity, drying, astringency and aroma
4. Seed tasting/maturity
  - a. Crushability, color, tannic intensity, astringency and bitterness.

Each parameter is judged on a 4 point scale so that there is no averages.

A full description of the method can be found online.

## VINEYARD SAMPLING

Random sampling is key, avoid the first five vines per row

Sample alternate sides of row

Sample at least 200 berries from each block, or 20 clusters (half from each side)

**Methodically sample 5 berries per cluster:**



1 berry each from right and right wing

1 berry each from central shadowed area and sunny area

1 berry from the tip

If the alternate side is looking and tasting different, then sample each side separately and evaluate independently.



# WINEMAKING PROTOCOL FOR FERMENTING UNDERRIPE FRUIT

WINEMAKING STAGE	GOAL	ADDITION	ADDITION RATE	NOTES
Harvest and Transport	Sort in the vineyard to remove as much of the underripe fruit as possible. Remove MOG before destemming and crushing.	Normal SO <sub>2</sub> addition. Consider the use of <a href="#">Inodose Granules</a> in the picking bins. Dry ice can also be used to lower temperature of fruit.	This is depending on pH.	In addition to your berry analysis, conduct a berry sensory assessment focusing on aromatic ripeness and acid profiles. If fruit contains >5% rot, follow the <a href="#">rot protocol</a> .
Fruit Reception and Grape Processing	Secondary sorting and fast processing is key.  Enological clarification enzymes help to break down grape pectin chains; this allows you to treat the fruit gentler and press at lower pressure so the pyrazines are minimally extracted from the skins.	<a href="#">Inodose Granules</a>  <a href="#">Scottzyme® Cinn-Free</a> or <a href="#">Lallzyme Cuvée Blanc®</a> can be used before pressing	As appropriate for the pH.  <a href="#">Cinn-Free</a> dosage: 20-30mL/ton  <a href="#">Pec5L</a> dosage: 15-20mL/ton	Appropriate SO <sub>2</sub> management offers some protection from oxidative browning.  Try to allow at least 2 hours of enzyme contact prior to pressing.
Pressing	Protect from any oxidative damage by pressing under a CO <sub>2</sub> blanket. Pressing to the lowest pressure is critical as 95% of the pyrazines are found in the grape skins. Consider destemming to eliminate the rachis. Separate (and possibly eliminate) the first 10 gallons per ton as the initial free run juice will contain dust and dirt from the vineyards and is high in vineyard spray residues. Taste your press cuts; evaluate and treat separately if required.			
Static Settling/Juice Clarification	Goal	Addition	Trial rate	Notes
	Clarification	<a href="#">Bentostab</a>	50-100g/hL	Bench trials should be conducted to determine the correct product and dosage. Remember to review the quality and quantity of lees as well as the impact on clarification, aromas, and mouthfeel.
		<a href="#">Cold Mix Sparkolloid</a>	12-24g/hL	
	Clarification & oxidation control	<a href="#">Freshprotect</a>	20-100g/hL	
	Clarification & removal of harsh phenolics	<a href="#">Inocolle</a> with <a href="#">Gelocolle</a>	30-60mL/hL of each. <a href="#">Gelocolle</a> is added 1 hour after <a href="#">Inocolle</a>	
		<a href="#">Colle Perle</a> with <a href="#">Gelocolle</a>	80-150ml/hL of each. <a href="#">Gelocolle</a> is added 1 hour after <a href="#">Colle Perle</a>	
	Removal of bitterness	<a href="#">Polycel</a>	40-80g/hL	Flotation and centrifugation can be used instead of static settling. Protect from oxidative browning irrespective of the method employed.
		<a href="#">Caséinate de potassium</a> with <a href="#">Gelocolle</a> <a href="#">Bentolact S</a>	50-100g/hL of each. <a href="#">Gelocolle</a> is added 1 hour after <a href="#">Caséinate de potassium</a>  20-100g/hL	

<b>Acid Management</b>	In addition to your standard acid chemistry analysis, run a separate malic acid and tartaric acid- or a predictive acid panel so that you can determine the final acid balance. If malic is high, it can be managed in the juice and the wine phases. For full details, see our managing malic acid protocol.			
<b>Alcoholic Fermentation</b>	<p>Begin the alcoholic fermentation as soon as possible. Use a yeast strain that will start quickly, while complementing your juice chemistry and desired wine style.</p> <p>If MLF is desired, co-inoculation with bacteria 24-48 hours post yeast inoculation is recommended to help maintain fruit flavors.</p> <p>Aromatic tannins added at the onset of fermentation may help elevate the fruity and floral aromas.</p>	<p><a href="#">Cross Evolution, CVW5</a>, or <a href="#">Anchor's Alchemy I, Lalvin 71-B®, Exotics, ICV Opale 2.0™, K1 (V1116)™ or QA23™</a>.</p> <p><a href="#">Biodiva</a> is a non-Sacc strain that will build mouthfeel and produce aromas</p> <p><a href="#">Beta Co-Inoc</a></p> <p><a href="#">FT Blanc Citrus™</a></p>	<p>25g/hL</p> <p>Per packet directions</p> <p>2-15g/hL</p>	<p>Some yeast can metabolize malic acid.</p> <p>Strains that build mouthfeel will help to integrate the acid.</p> <p>Maintain a fermentation temperature from 60 - 72°F. This will promote good fruit flavors. Minimize yeast stress and allow fermentation to finish in a timely manner.</p> <p>Best if used in conjunction with a yeast strain with B-glycosidase activity.</p>
<b>Fermentation Nutrition &amp; Inactivated Yeast</b>	<p>Make sure that the yeast has the nutrients (macro and micro) available to conduct a rapid and clean fermentation. Nutrients may be deficient due to the microbes, and the clarification.</p> <p>At the onset of fermentation (2-3 brix drop)</p> <p>At 1/3 sugar depletion</p> <p>Protect aromas from oxidation (add with first nutrient add at 2-3 brix drop or as fermentation is nearing completion)</p>	<p><a href="#">GoFerm Protect Evolution™</a> during rehydration</p> <p><a href="#">Fermaid O™</a></p> <p><a href="#">Fermaid K™ or O™</a></p> <p><a href="#">Stimula Chardonnay</a></p> <p><a href="#">OptiMUM White®</a></p>	<p>30-45g/hL</p> <p>10-40g/hL depending on YAN</p> <p>10-40g/hL depending on YAN</p> <p>40g/hL</p> <p>20-40g/hL</p>	<p>This is to protect and stimulate the cells, minimizing the lag phase. High sterol and unsaturated fatty acids levels in Goferm Protect Evolution eliminate the need for O<sub>2</sub> additions.</p> <p>Nourishes yeast and promote fruit driven wines.</p> <p>Replaces the nitrogen used during the yeast growth phase.</p> <p>Used by the yeast to produce esters. Promote fruit expression to overcome under-ripe notes.</p> <p>A second addition at the end of fermentation can reduce bitter or astringent characters.</p>

Racking	Let gross lees settle for 24-48 hours and then rack to a clean tank. Keep press fraction fermentations separate for as long as necessary. If vegetal character still persists add 10g/hL of ICV Noblesse®. Rack under a CO <sub>2</sub> blanket if needed.					
Malolactic Fermentation	If MLF is desired, make sure you conduct post fermentation analysis so that you use a compatible MLF strain. Inoculate as soon as possible, even if wine is slightly sweet, but looks like it is going to complete alcoholic fermentation.	<a href="#">Opti-Malo Blanc™</a>	20g/hL added just after ML inoculation	This will provide the bacteria with essential nutrients so that the MLF can be conducted in a timely manner.		
		<a href="#">Alpha™</a> or <a href="#">MBR31®</a>  <a href="#">Beta™</a> or <a href="#">PN4™</a>	1g/hL	These strains conduct a fast ML, optimizing fruitiness and balance.  These strains will enhance the complexity of the wines providing a nice buttery note.		
Post Fermentation Management and Aging	Manage topping and SO <sub>2</sub> treating regime. Conduct trials with cellaring tannins due to their structure building and anti-oxidant qualities. If wines are harsh in the mouth then gelatin and PVPP trials can be run.	<a href="#">Scott'Tan FT Blanc Citrus™</a> , <a href="#">Scott'Tan Estate™</a> , and <a href="#">Scott'Tan Refresh™</a> .  Gelatins: <a href="#">Colle Perle</a> and <a href="#">Inocolle</a>  PVPP: <a href="#">Polycel</a>	Bench trials can be conducted to determine dose based on wine style and desired outcome.			
Filtration	The wine may have filtration issues if complex polysaccharides are present (glucans, pectins, etc). It may be useful to conduct a filterability test. If the filterability test fails and the wine is clean, then you may wish to conduct trials with <a href="#">Scottzyme KS®</a> , or <a href="#">Lallzyme MMX™</a> . <a href="#">Lallzyme MMX</a> may take up to 6 weeks to break down the glucans. For a nice guide to managing filtration please <a href="#">click here</a> .					
Finishing & Packaging	Trial tannins under our Luxe range. <a href="#">Scott'Tan Royal</a> , <a href="#">Scott'Tan Radiance</a> and <a href="#">Scott'Tan Onyx</a> are designed to bring out elegance, complexity and balance. Due to their production process they can be used up to 48 hours before bottling. If added softness is required, then <a href="#">Flashgum R Liquide</a> or <a href="#">UltIMA Soft</a> may be beneficial. Protect your aromas from oxidation throughout the packaging process.					