SCOTT LABORATORIES

OPTIMIZING WINE FROM UNDERRIPE RED GRAPES

UNDERRIPE FRUIT MANAGEMENT

REDS

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, a 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 red 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 allows you to design your fermentation protocols to optimize resulting wine quality.
  - Conduct a berry sensory assessment and evaluate fruit condition.
- Eliminate MOG; leaves are high in pyrazines.
- Sort the fruit and separate into different lots if necessary.
- Treat the fruit gently throughout the process.
- Do not cold soak; it will highlight green flavors.
- Decrease fermentation length; eliminate seeds early in the process if they are unripe.
- 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 minimize vegetative flavors.
- Do not conduct an extended maceration as that will increase bitterness from unripe seeds.
- Work sensibly to enhance structure.
- Consider using oak infusion products such as chips, cubes or bung inserts to minimize greenness.
- Manage oxygen additions during fermentation to stabilize color and tannin structure.
- Heat can be used to blow off some green notes, but that is non-discriminatory.
- LalVigne™ can help if underripe fruit is common in certain vineyard blocks.

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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 left 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.

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 Rosseau and has been adopted globally. This method evaluates berries from four 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)
2. Skin tasting/maturity
   a. Crushability, acidity, tannic intensity, drying, astringency and aroma
2. Seed tasting/maturity
   a. Crushability, color, tannic intensity, astringency and bitterness

Each parameter is judged on a 4 point scale so that there is are averages. A full description of the method can be found online.

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WINEMAKING STAGE	GOAL	ADDITION	ADDITION RATE	NOTES
Harvest & Transport	Sort in the vineyard to remove as much of the under-ripe fruit, and MOG as possible.	SO_2 addition. Consider the use of Inodose Granules in the picking bins.	This is depending on pH. It should be adapted accordingly.	In addition to your vineyard analysis, run phenolics tests and conduct berry sensory analysis. If fruit contains >5% rot, follow rot protocol.
Fruit Reception & Grape Processing	Begin fermentation as soon as possible, do not conduct a cold-soak as this may enhance the vegetative flavors and aromas. Processing the fruit using heat (thermovinification, flash détente or pasteurization) may help to blow off some of the undesirable pyrazines.	Lallzyme EX™, Lallzyme EX-V™ or Scottzyme® ColorPro	20-30 g/ton, 15-20 g/ton, 80-100 mL/ton respectively.	Respect a 6-8 hour time interval between enzyme and tannin addition.
		FT Rouge™, FT Rouge Soft™, FT Rouge Berry™, Feelwood! Balance and Structure or Feelwood! Feelwood Sweet and Fresh	200-600 ppm depending on tannin or oak chip choice and goal.	Add tannins directly to the crusher. If FT Rouge Berry is used add at the onset of fermentation. Add oak chips to tank during filling.
Alcoholic Fermentation	You want a secure alcoholic fermentation. Use a yeast strain that will start quickly, promote good fruit character and texture while minimizing herbaceous/ vegetative flavors and stabilizing color. In some cases, some *Saccharomyces* can metabolize malic acid. If MLF is desired, you can consider a co-inoculation 24 hours post yeast addition. This is a way to amplify the fruitiness.	Alchemy III or IV, Lalvin ICV GRE™, Enoferm CSM™, BDX™. If VA is not elevated, then D254® and CVRP are good choices. To bring sweetness to high brix fruit then consider using Tango Malbec™ to balance the acidity.	25-35 g/hL	For high brix fruit increase the inoculum. Ferment no hotter than 80°F to promote good fruit flavors and minimize yeast stress. If vegetative flavors are dominant, then shorten the fermentation. Conduct a délastage at ⅓ sugar depletion and remove seeds if needed.
⅓ of Alcoholic Fermentation Onwards	To assist with color stability.	FT ColorMax™	100-300 ppm	This should be used in conjunction with other fermentation tannins.

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Fermentation Stimulation, Nutrition & Yeast Derivative Nutrients	Ensure that the yeast has the nutrients (macro and micro) available to conduct a rapid and clean fermentation. To help stabilize color and build a balanced palate add at the onset of fermentation, if harsh phenolics are evident it can be used during the later stages.	Go-Ferm Protect Evolution™ during rehydration Opti-Red™	30-45 g/hL 20 g/hL	Go-Ferm Protect Evolution protects and stimulates the cells, minimizes lag phase, and compensates for nutrient deficiencies. It replaces the thiamin has been deactivated if you used >50 ppm SO_2.
		Fermaid O™ at 2-3° Brix sugar drop	10-40 g/hL	This is to nourish the cells minimizing heat spikes, yeast stress while promoting good aromatics.
		Fermaid K™ or Fermaid O™ at ⅓ sugar depletion	10-40 g/hL	This replaces nitrogen used during the yeast growth phase.
	If vegetative flavors persist:	Noblesse™	10 g/hL	
Pressing and Racking	Taste throughout the fermentation process to determine skin contact length. In the most challenging situations, you may have to shorten your time on solids. Drain free run to a tank; taste press fractions and isolate, keeping fractions separate if necessary. Let gross lees settle for 24-48 hours and then rack to a clean tank.			
Malolactic Fermentation	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.	Alpha™ or Elios 1™	1 g/hL	Both strains will conduct a rapid MLF. Alpha will help to minimize vegetative characters, and produce texture-building polysaccharides.
		ML Red Boost™	20 g/hL	This will provide the bacteria with essential nutrients so that the ML can be conducted in a timely manner.

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Post Fermentation Management, Aging and Fining	Manage your topping and SO_2 regime. Conduct trials with cellaring tannins due to their structure building and anti-oxidant qualities. If tannins are slightly aggressive, then gelatin trials can be run. If bitterness is present, then casein or PVPP based fining agents can be trialed. To unmask aromas hidden by sulfur-like off-odors:	Scott'Tan Tannin Estate™, Riche™ or Riche Extra™ Gelatins: Colle Perle and Inocolle Caseins: Caseinate de Potassium and Polycacel, Polycel Reduless™	Bench trials can be conducted to determine dose based on wine style and desired outcome.	
Filtration	It may be useful to conduct a filterability test. If the filterability test fails and the wine is clean, you may wish to conduct trials with Scottzyme KS®, or Lallzyme MMX™. The MMX may take up to 6 weeks to work. Review our guide on managing filtration.			
Finishing & Packaging	Trial tannins Scott-Tan Royal™, Radiance™ and Onyx™ which 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 the wine is slightly unbalanced, then trials with UltiMA Soft and Flashgum R Liquide may prove to be beneficial. Protect your aromas from oxidation throughout the packaging process.			

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