Key points to avoid harsh tannins and herbaceousness with uneven ripe grapes. Red wines

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Main problems associated with uneven ripe grapes

1. Low pigment potential in many berries:
    a. Low participation to the colloidal matrix and its stability.
    b. High risk of color instability.
2. Low tannin ripening in many berries, including the colored ones: risk of harsh sensations, amplified by high alcohol (higher then 13%vol.).
3. Low aroma ripening in many berries, including colored ones:
    a. Low potential of fruity aromas and soft mouthfeel sensations.
    b. High risk of herbaceous characters and bitterness.
    c. High risk of negative synergy with sulfur off-aromas and sulfur-off taste from the fermentation.
    d. High risk of negative synergy with meaty, horsy, sulfur off-aromas and sulfur-off taste from *Brettanomyces*, *Pediococcus, Lactobacillus* and / or indigenous *Oenococcus*.
4. Low pulp and skin cell walls ripening:
    a. Low participation to the colloidal matrix and its stability.
    b. Limit the diffusion of the hydrosoluble pigments, polyphenols and aromas.
    c. Risk of aggressive sensation due to tartaric acid in case of pH adjustment.

On top of those problems, in warm areas, high Brix grapes give the following classical problems:

1. High osmotic stress on the yeast amplifying VA risk, that will amplify the harsh and dry sensations.
2. Low organic assimilable nitrogen for the yeast. That will amplify the risk of sulfur off odors and tastes that will amplify the harsh and herbaceous problems.
3. High alcohol concentration early during maceration. That will amplify the extraction of harsh hydrophobic phenols during maceration
4. High alcohol concentration in the wine. That will amplify all aggressive perceptions (ethereal, herbaceous on the nose; burning, bitterness on the palate.)

Main winemaking axis to manage uneven ripe grapes

1. Avoid the extracting of harsh green characters from the grapes.
2. Avoid the production of negative microbial characters:
    a. Sulfur off odors and acetic acid by the yeast during fermentation and aging.
    b. Sulfur off odors and acetic acid by the lactic acid bacteria (LAB) during MLF (malolactic fermentation).
    c. All negative characters from *Brettanomyces*, *Pediococcus*, *Lactobacillus* and indigenous *Oenococcus* during fermentation and aging.
3. Build a concentrated and stable colloidal matrix during maceration and fermentations:
    a. Early pH adjustment (between 3.3 and 3.4 for Pinot Noir, for example; between 3.4 and 3.5 for other varieties).
    b. Early diffusion of hydrosoluble polysaccharides, pigments, fruity aromas and phenols from the grape.
    c. Early building of a concentrated yeast polysaccharide matrix with ripe and stable aromatics from the yeast.
    d. Early building of a concentrated LAB polysaccharide matrix with ripe and stable aromatics from the LAB.
    e. Early building of an oak molecules matrix with sweet and ripe characters.
    f. Early stabilization of the colloidal-phenolic matrix with the right dosage and frequency of oxygen macro-additions.
4. Stabilize the colloidal-phenolic-aromatic matrix during the first steps of aging.
    a. Active building of a concentrated yeast polysaccharide matrix with ripe and stable aromatics from the dead yeast.
    b. Active building of a concentrated LAB polysaccharide matrix with ripe and stable aromatics from the dead LAB.

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c. Active building of an oak molecules matrix with sweet and ripe characters.
d. Stabilization of the colloidal-phenolic matrix with the right dosage and frequency of oxygen macro-additions and micro-oxygenation.
e. Stabilization of the colloidal-phenolic matrix with the right pH level.

Key winemaking actions, in their chronological order

Between parentheses, the number and letter refer to the axis above.

1. At the reception, adjust pH (axis 3a) and add 25-35 ppm SO_2 (axis 2a). *Note: More SO_2 is useless but gives extra sulfur resources for the yeast.*
2. Add maceration enzymes Lallzyme EXV at 10 ppm (axis 3b). *Note: selected maceration enzymes do not amplify the extraction of harsh character. They are useful for axis 3b.*
3. Crush (axis 3b) and destem (axis 1).
4. Adjust temperature to 20°C (axis 1 & 3b). *Note: cold soak is not recommended with uneven ripe grapes. It may amplify the green characters.*
5. Add oak chips: French oak, toasted (axis 2a & 3e). *Note 1: around 1 g/L to balance the uneven ripening, around -5 g/L to build the wine body. Note 2: non-toasted oak amplifies the green risks and do not limit sulfur off odors risk. Note 3: American oak amplifies the harsh risk with such grapes.*
6. Add specific inactivated yeast / enzyme complex (RedStyle at 300 ppm) while filling the tank (axis 2a & 3c).
7. Inoculate with yeast strain Enoferm VQ15 or Lalvin ICV-GRE (axis 2a, 2c & 3c) at the right dosage (250 to 350 ppm, according to the Brix). Protect the yeast during rehydration with Enoferm Protect (axis 2a, 2c & 3c) at the right dosage (300 to 400 ppm according to the yeast dosage). Adapt the yeast temperature to the juice temperature (axis 2a).
8. Keep temperature at 20°C for 2-3 days (axis 1, 2a & 3b). *Note: such temperature limits the risk of sulfur-odors from the yeast.* Add a complex nutrient for the yeast growth (Fermaid K at 125 ppm) (axis 2a & 3c).
9. One day after yeast inoculation, inoculate with LAB Enoferm Alpha for a co-inoculated malolactic (axis 2b, 2c, 3d). *Note: co-inoculation is a powerful tool to prevent the growth of spoilage germs.*
10. As soon as the cap is formed, try to manage the extraction with delestage, 2 times a day if possible (axis 1, 2b & 3b). If the delestage program is respected, no other cap management actions. If delestage is not possible, make 2 long pumping over (150% of the juice volume). Avoid frequent short pumping over. *Note: whatever the cap management, the initial enzyme addition do not amplify harsh extraction, as far as maceration length is respected (see below).*
11. As soon as the cap is formed add oxygen 2 times a day (axis 2a & 3f). Dosage: 4-5 mg/L for varieties like Pinot Noir, Grenache; 6-8 mg/L for varieties like Cabernet Sauvignon, Syrah. If specific and precise macro-oxygenation devices are not available, do the delestage or the pumping over with air.
12. If equipped with agitator, agitate the juice below the cap twice a day (axis 2a & 3c).
13. At one third of sugar depletion add a complex nutrient for the yeast (Fermaid K at 125 ppm) (axis 2a & 3c).
14. After 2/3 through active fermentation, go to 23-24°C (axis 1, 2a & 3b).
15. Drain and press when color peak is reached, before harsh and aggressive tannins are perceived (axis 1 & 3b). Usually this occurs 3 to 5 days after the cap formation, according to the grape and the cap management technique. Separate the pressings. Evaluate their profile before blending back (axis 1)
16. The very day after draining, rack the fermenting juice from its heavy vegetal lees (axis 1 & 2a). *Note: The heavy lees have sedimented and are easily separated from the juice, even if the juice is still fermenting. It is a key point to eliminate those vegetal particles as they may go on releasing harsh and green characters to the fermenting juice. This racking is also a key point to avoid sulfur off odors production during the finish of the fermentation.*
17. Right after that racking, for the finish of fermentation off the skins:
    a. Add some oak chips in bags (0.5 to 1.0 g/L according to wine style) (axis 2b, 3e & 4c)
    b. Add 200 ppm OptiRed if green or harsh characters are present or if the mouthfeel is not big enough (axis 2a, 3c & 4a)
    c. Stir the lees twice a day until sugar complete depletion (axis 2a, 3c & 4a)
    d. Add oxygen twice a day until sugar complete depletion (1-2 mg/L according to the wine polyphenolic concentration and the presence or not of sulfur off-odors) (axis 2a, 3f & 4d). If not equipped with precise macro-oxygenation, make an aerated pumping over a day until 2-3 Brix.

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    e. Check malic acid level frequently.
18. The very day sugar are finished:
    a. Rack (axis 2a & 2b)
    b. Transfer the oak chips to the racked wine (3e & 4c)
19. Until 50% of malic is consumed:
    a. Stir once a day (axis 2a, 2b & 4a)
    b. Continuous micro-oxygenation at 5-15 mg/L/month (2a, 2b & 4d). *Note: Higher micro-oxygenation are not recommended with such wines as micro-oxygenation is not a cure for herbaceous characters and there is the risk of amplifying harshness with excess micro-oxygenation.*
    c. Check malic acid level frequently.
20. At 50% of malic acid consumption: stop micro-oxygenation (axis 2c & 4d).
21. The very day of malic acid complete depletion:
    a. Adjust pH to the market goal (axis 4e)
    b. Add 40-50 ppm SO2 according to the pH level (axis 2c).
22. Next day, rack. Oak chips follow the racked wine. Chips contact should not exceed one month (axis 4c).
23. Stir regularly for at least one month. Adapt micro-oxygenation. Check the level of living spoilage germs. Check if another OptiRed addition (200 ppm) is necessary to build the wine mid palate and cover the green harsh characters. Another racking is necessary 15 to 30 days after the previous one.

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