WINE STYLE FOCUS

PÉT-NATS

DEFINING THE WINE STYLE

Pét-nats, believed to be the original source of sparkling wine production in France (Robinson and Harding 2006), are lightly bubbled sparkling wines which finish fermentation post-bottling. The term "*pétillant*" generally describes a sparkling wine with less retention of carbon dioxide compared to a traditional sparkling wine like Champagne (WSET 2001). As such, *pét-nats* do not traditionally hold as much pressure as a traditional sparkling wine. Additionally, final production usually results in a cloudy wine, typically with varying concentrations of residual sugar and retention of carbon dioxide.

PRE-PRODUCTION GRAPE SPECIFICATIONS

Like many styles of wines, quality *pét-nats* can only be produced from sound quality fruit. Unlike traditional sparkling wines, immature fruit should be avoided. Additionally, overripe fruit should also be avoided. However, acid management and sugar are important attributes to consider when choosing a wine grape variety destined for *pét-nat* production.

PARAMETER	WHAT TO LOOK FOR	REASONING
Grape Variety	You can use any grape variety to produce a *pét-nat*.	There is no standard grape variety for this style of wine.
Grape/Juice Sugar	18 – 21 °Brix	Ripeness should be high enough to create a wine with a finished alcohol between 10 – 12%. Lower, and there is a loss of stability. Higher, and the alcohol dominates the wine's flavor.
Grape/Juice pH	<3.50	Lower pH wines with noticeable acidity will help stabilize a *pét-nat*. Additionally, this will help maintain

		freshness through the duration of the wine's shelf life.
Grape/Juice Flavors	Lack vegetal flavors. Grapes should be at optimal flavor ripeness (*i.e.*, fruity).	Vegetal flavors, or unripe grapes, should be avoided. Green flavor characteristics will be enhanced with the presence of carbon dioxide. It's important to avoid grapes overly ripe in flavor, as these characteristics typically correlate with high pH's and lower acidity, leading to stability issues.
Grape Disease Presence	Minimal to no disease pressure on the fruit.	Disease presence contributes to off flavors in the wine. Additionally, many diseases offer production challenges that may interfere with *pét-nat* stabilization.

REMEMBER SAFETY FIRST

Since *pét-nats* are sparkling wine products that contain a fair amount of pressure, winemakers and cellar staff should proceed with caution during production. Use common sense: purchase appropriate bottles made to withstand pressure, double check calculations for sugar-to-pressure conversions, and use protective eye glasses when handling the product. Accidents can happen, and it is best to be prepared for any hazard associated with any stage of wine production.

Sanitation and temperature control are essential components of *pét-nat* production. Using both of these tools properly contributes to wine quality.

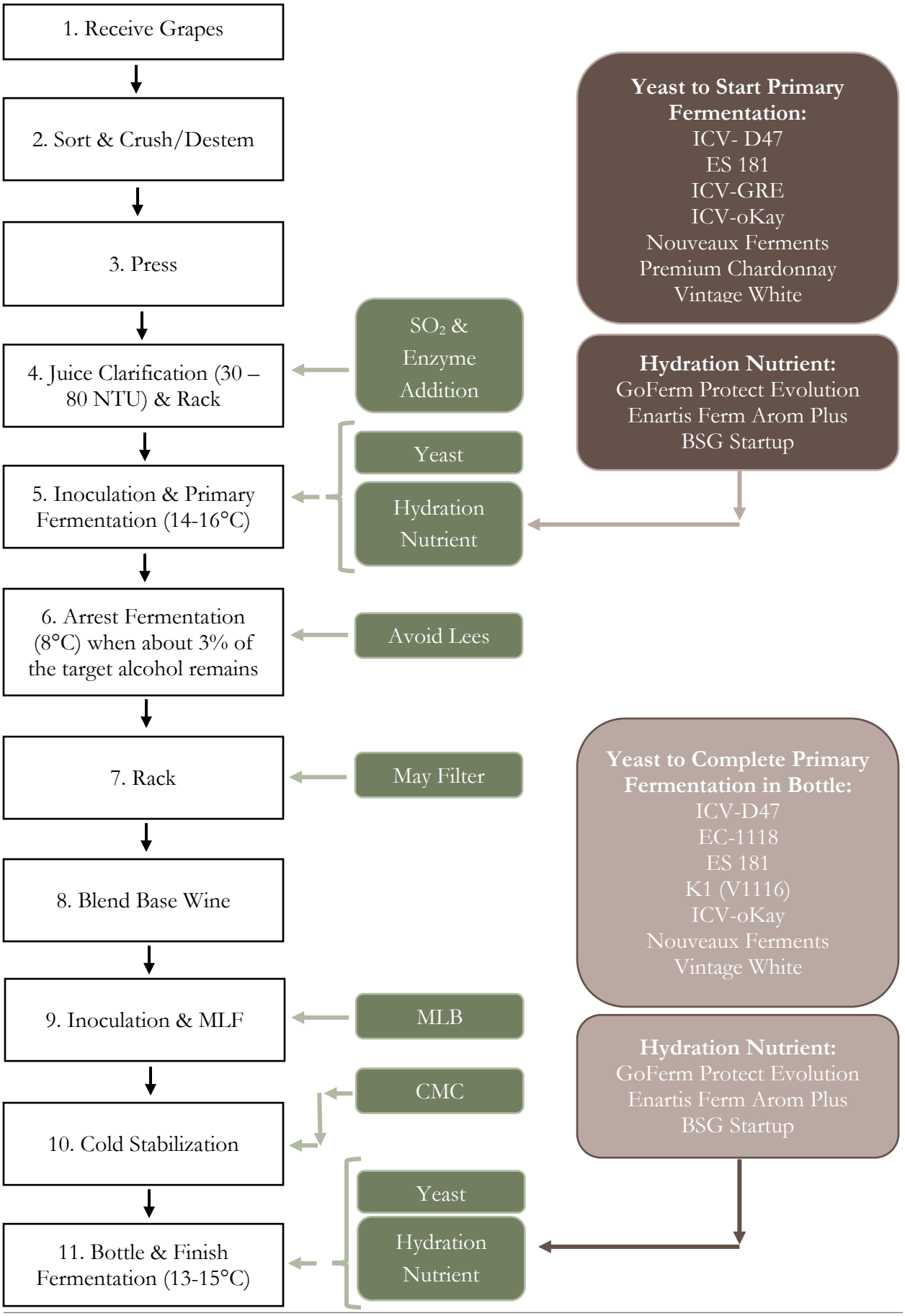
Proper protective clothing should be worn at all times when using sanitizing agents of any kind.

PÉT-NAT PRODUCTION

The production method associated with *pét-nats* is alluded to rather simply in the wine literature: the primary fermentation is started in tank, arrested before primary fermentation is completed, bottled, and finished in the bottle. The consumer can expect a slightly sweet (*i.e.*, presence of residual sugar), cloudy, lightly bubbled wine (usually below 4 ATM pressure; Amerine et al. 1972).

However, the following details more specific production steps related to *pét-nat* production.

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PÉT-NAT TROUBLESHOOTING

There are many places where *pét-nats* can leave a skilled winemaker puzzled. While challenging, the production of these wines also provides a great learning experience. Here a few tips and considerations when diving into *pét-nat* production:

Practice Bottle Conditioning Techniques

- Consider getting good at bottle conditioning first. Using a low alcohol (≤12% alcohol v/v), low pH (<3.50) wine practice adding sugar to generate 3 – 4 ATM of pressure with a yeast addition based on *pét-nat* production techniques. This will help you become more comfortable with the end bottling and finishing processes, as well as teach you the amount of care needed for these products. Need some help with bottle conditioning? Visit Northern Brewer's Advanced Bottle Conditioning and Bottle Carbonating informational guides.

Primary Fermentation

- While I've provided you some yeast suggestions, you can choose any yeast you would like to start primary fermentation. However, the yeast you select should have the following properties:
    - Select low-sulfur dioxide-producing yeast strains (avoid EC 1118).
    - Review yeast secondary aroma potential, and focus on fruity-producing strains.
    - Supply yeast with the proper hydration and fermentation nutrient additions to avoid hydrogen sulfide production. Measuring YAN prior to fermentation is recommended.
    - Use yeasts that grow optimally at cool temperatures, 14-16°C (~57-60°F).
- Controlled doses of oxygen are sometimes added during primary fermentation when conditions require it.
- Use of temperature control is essential to produce a quality *pét-nat*. Without it, the *pét-nat* will likely end up flawed or offer more production challenges for the winemaker.

Clarification

- After primary fermentation (and before bottling), the wine will need to be chilled and racked off of the lees. Lees removal is essential.
- Centrifugation and filtration to arrest and clarify the *pét-nat* mid-production are not uncommon processes.
- The second fermentation can be restarted with proper yeast inoculation and a supplemental nutrient addition.

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Blending

- If you want to create a "house-style" *pét-nat,* consider blending base wines to enhance year-to-year consistency.

Malolactic Fermentation

- Malolactic fermentation is optional. However, there are many things that can go wrong undergoing malolactic fermentation with significant residual sugar in the wine:
    - pH: Malolactic bacteria have a higher risk of producing acetic acid (VA) during MLF if the wine pH is greater than 3.50.
    - Temperature: Malolactic bacteria require a warmer [wine] temperature for their growth. For this reason, sterile filtration prior to MLF is recommended to avoid re-starting primary fermentation and potential spoilage. As a side note, warming the wine will alter the aroma and flavor and mouthfeel of the wine.
    - Residual Sugar: The remaining sugar in the wine puts the wine at risk for other microbiological spoilage. Sanitation is of utmost importance.

Cold Stabilization

- Tartaric acid stabilization (cold stabilization) can be completed using traditional cold stabilization techniques, or with the addition of crystal-inhibitory agents like CMC.

The Second Fermentation

- If you are going to disgorge the wine before sale (like in *Méthode Champenoise* production), select a second yeast strain to finish primary fermentation that is recommended for *Méthode Champenoise* production.
- During the second primary fermentation, a hydration nutrient (prepared during yeast hydration) and a smaller dose of a complex nutrient (*e.g.*, Fermaid K, Nutriferm Advance) should be considered for fermentation completion. Yeast addition dosage rate is recommended at about 2 million colony forming units (CFU) per mL of living yeast. Ideally, yeast addition should be less concentrated than a "normal" inoculation to minimize biomass and encourage a slow fermentation in the bottle.
- The second fermentation should be slow and progress at a 13-15°C (~55-59°F) temperature range for optimal quality. Choose an appropriate yeast strain for this temperature range.
- Make sure you use a bottle appropriate for the concentration of pressure (3-4 ATM max for traditional *pét-nats*) that will build up in the bottle. Yeast selection should be altered if the final preferred pressure is greater than 4 ATM.
- Disgoring is a possibility, though breaks away from traditional *pét-nat* production. If you would like to disgorge the yeast after the second fermentation, consider the addition of a

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riddling aid. Follow similar processing steps associated with traditional sparkling wine production.

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