

THE BASICS OF WINE

Why should we write another book about the basics of wine when hundreds of them already exist? Well, for a few reasons. First of all, we wanted to put all basic knowledge about wine into one clearly-structured, easy-to-use little book. There are four big chapters, and each of them is made up of short texts of one easy-to-read paragraph containing all information necessary to understand wine. Each text comes with one photo, illustrating the subject at a glance. Very simple, very clean.

But there is more. This book is meant both for the absolute beginner who just bought his first bottle of wine and the connoisseur looking for in-depth information. We've structured the book in such a way that simply dipping in and out of it your wine knowledge will grow. The first texts are therefore really about the most basic things: What is wine? What does good wine taste like? How do I choose wine from an overcrowded supermarket shelf? Which glasses should I use? Further chapters contain more in-depth knowledge with very concrete examples: How to combine wine with food? What is the vine like? How does climate influence a wine's taste, and what about terroir? How is

wine made, and what really happens in the winery? There's a lot of technology involved in winemaking, and we want people to know.

One last reason why we've created this book is that we want to provide "real" knowledge, based on professional know-how. All three authors have professional wine qualifications and proven their worth. English Fiona Morrison is a Master of Wine who owns the famous domain Le Pin in Pomerol, France; German Romana Echensperger was a top sommelier in Germany before going into writing and consulting, while Belgian Filip Verheyden produces an internationally awarded wine magazine. Both Echensperger and Verheyden are Master of Wine candidates.

We hope that you will like this little book and that it will increase your passion for the wonderful drink that is wine.

The authors

POURING WINE The sequence of wines generally follows the order of the menu. Sparkling wine or Sherry as an aperitif, white wine with the first course, red wine with the main course and sweet wines with dessert. If several white wines are served the lighter, fresher styles should precede stronger, oak-aged wines. The same goes for red wines. Sweet wines are generally served last as any dry wines tasted after them would appear dull. But this rule is not always observed: especially when foie gras appears as a first course, which is best accompanied by a sweet wine. In this instance it would be a good idea to allow for a small break or to refresh the palate with a sorbet before moving on to the next wine.

Young, fruit-forward wines should be served before more complex mature wines. Sparkling and sweet wines are served between 6-10°C (43-50°F); and white and rosé wines at 6-14°C (43-57°F). As a rule, the simpler the wine the cooler the serving temperature must be. Potent, tannic red wines are best poured between 15-18°C (59-64°F), the same goes for Port. If these wines are served too cold, their tannins tend to dominate, if they are served too warm alcohol will push fruit and flavour into the background. Soft, non-tannic red wines can be served at 12-16°C (54-61°F) which will accentuate their fruitiness. The same rule applies: the simpler the wine, the cooler the temperature.



YOUNG OR MATURE WINE?

What happens during maturation? For one thing, the wine's colour changes: red wine showing purple tinges in its youth can appear garnet or even brick red when mature. The tannic structure changes at the same time. Both processes are down to changing phenolic compounds. In red wine the two most important phenolic compounds are anthocyanins which give wines their colour, and tannins which lend structure. Young red wines have numerous small, loose tannic particles that provide lots of reactive surface: these tannins bind the protein in our saliva and thus account for the astringent, drying sensations in the mouth. During maturation, both tannin and anthocyanin particles polymerise to form longer chains which have less reactive surface and make the wine taste softer and less astringent. Over time, these chains become longer and longer: their increasing size makes them less soluble so they precipitate and form a deposit. This reduces both tannin and blue pigment and explains the less intense colour, the change from purple to red or tawny hues and the dark sediment in mature red wines. White wines contain different phenolic compounds which oxidise during maturation and slowly turn darker.

Maturation also changes the aromatic profile of a wine as the various constituents react with each other to create new aroma compounds: the intense fruit notes of a young wine can turn into a complex bouquet revealing exciting new facets of flavour. Mature red wines typically show notes of truffle, undergrowth, tobacco and hay whereas white wines tend to develop nutty, herbal and honeyed notes. Primary fruit flavours become less perceptible as the wine matures.

There comes a point, however, when a wine is past its best. In white wines this can mean a nose of bruised apples and a metallic aftertaste, a thin, listless body or a predominantly sour almost acetic flavour. Red wines will have a tawny hue, lack fruit aromas and taste thin, bitter and acidic.

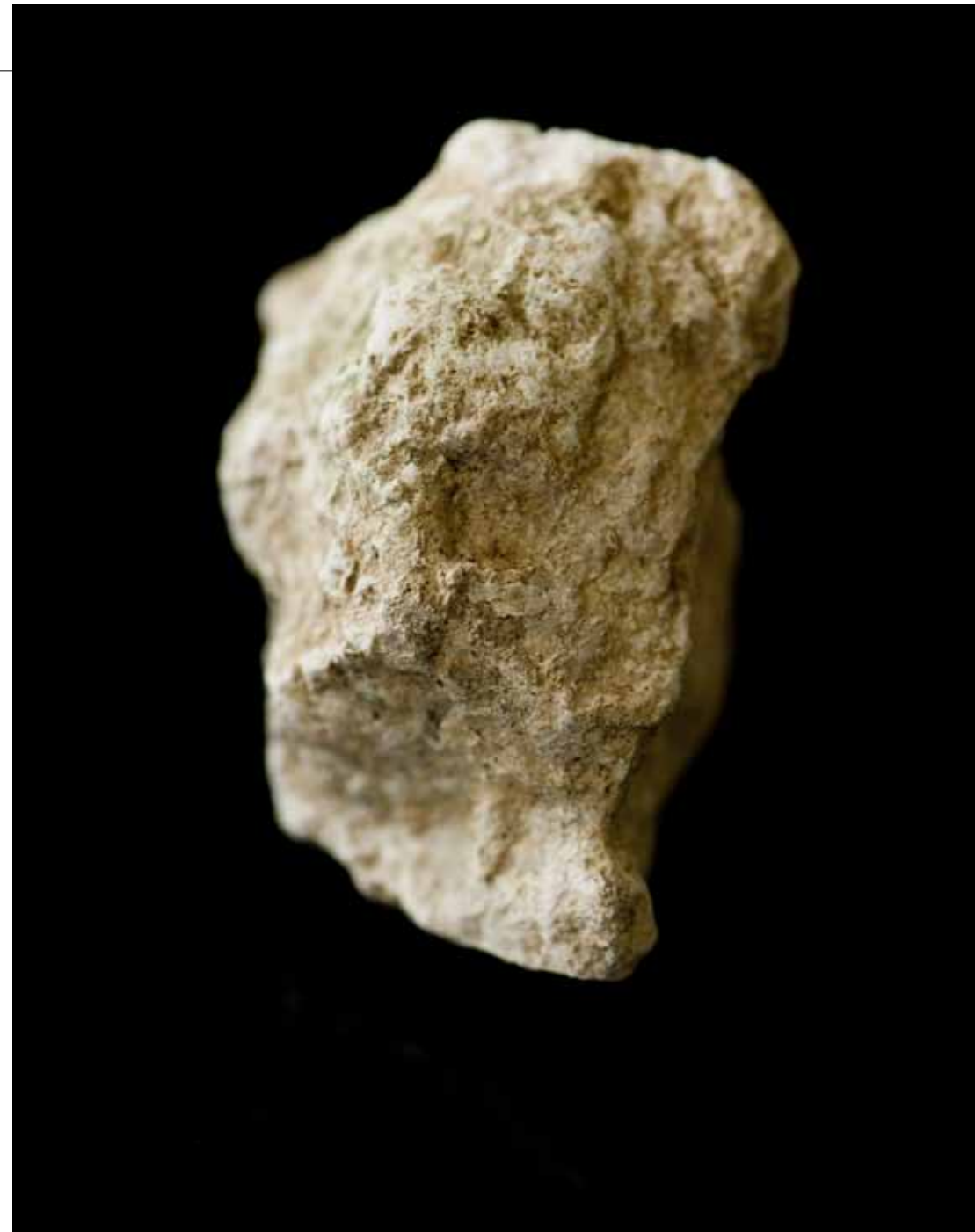


MINERALITY IN WINE

The word “minerality” often crops up in tasting notes, especially when describing white wine. This often implies that there should be a direct link between the minerality of soil and wine. The generally accepted notion assumes the higher the mineral content of the soil, the more intense the mineral flavour in wine. This is nonsense. Most minerals do not have a flavour and at most a slightly salty taste. Their presence in wine is minute and they go organoleptically unnoticed amongst fruit flavour, tannin, acidity and alcohol.

Scientific trials have shown that there is no direct relationship between soil composition and the flavour of wine. Minerals are essential plant nutrients necessary for growth, photosynthesis, etc. The most important minerals are nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and iron. A surplus of minerals in the soil causes vigorous growth of the vine and excessive yields that result in a thin and flat wine. Therefore the theory that more soil minerals make a more complex wine is obsolete.

“Mineral” wines are mostly grown on stony soils which tend to be poor because they contain little nutrient-rich humus. Vines on stony soils have to fight for survival and the grapes, just like the vines, accumulate few minerals, especially very little nitrogen. This can cause problems during fermentation as yeasts require nitrogen to convert sugar into alcohol. If there is insufficient nitrogen in the grapes, yeasts will split sulphur-containing amino acids to access nitrogen. This can cause the formation of volatile sulphur compounds which can come across as “mineral” in wine. This does not point to a sulphur-rich soil but explains the indirect link between soil and wine flavour.



MUSHROOMS AND TRUFFLES

There is a huge variety of mushrooms and truffles. All of them find different uses in the kitchen. Most exclusive among them are truffles, either black or white. The latter works its intensely aromatic magic in the nose rather than on the palate. To vaporise its beguiling scent, it is shaved thinly over simple, warm dishes like buttered tagliatelle or fried eggs on spinach. White wines made from Viognier are perfect accompaniments, like Condrieu from the northern Rhône. These wines display intense notes of musk, lily-of-the-valley and apricot and counter the strong truffle perfume while their typically creamy texture echoes the food. Black truffles are less scented but have an intense and unique flavour. They are used to aromatise hearty sauces and other boldly flavoured produce. Mushroom varieties like morel, cep (porcini) or chanterelle are very versatile and lend earthiness as well as notes of moss and undergrowth to food. Accompanying wines should have so-called tertiary flavours, these refer to the aromas a wine gains only with age. Mature wines develop a complex bouquet often reminiscent of earth, truffle, undergrowth and moss. Mature and powerful white wines go well with truffle or mushroom-accented fish dishes, like Grüner Veltliner from Kremstal in Austria, Chardonnay from Burgundy in France or from California's Russian River Valley, or even a dry Pinot Gris from Alsace. Meat dishes work well with mature, potent red wines like Barolo or Barbaresco from Piedmont in Italy, French Bordeaux, Napa Valley Cabernet Sauvignon or an elegant Pinot Noir from the Old or New World. Red wines from the northern or southern Rhône are eminently suitable, too. Another successful match is Amontillado Sherry whose yeasty mushroom notes and concentrated body are perfect for dishes with champignons, field or chestnut mushrooms.



MODERN AND MOLECULAR CUISINE

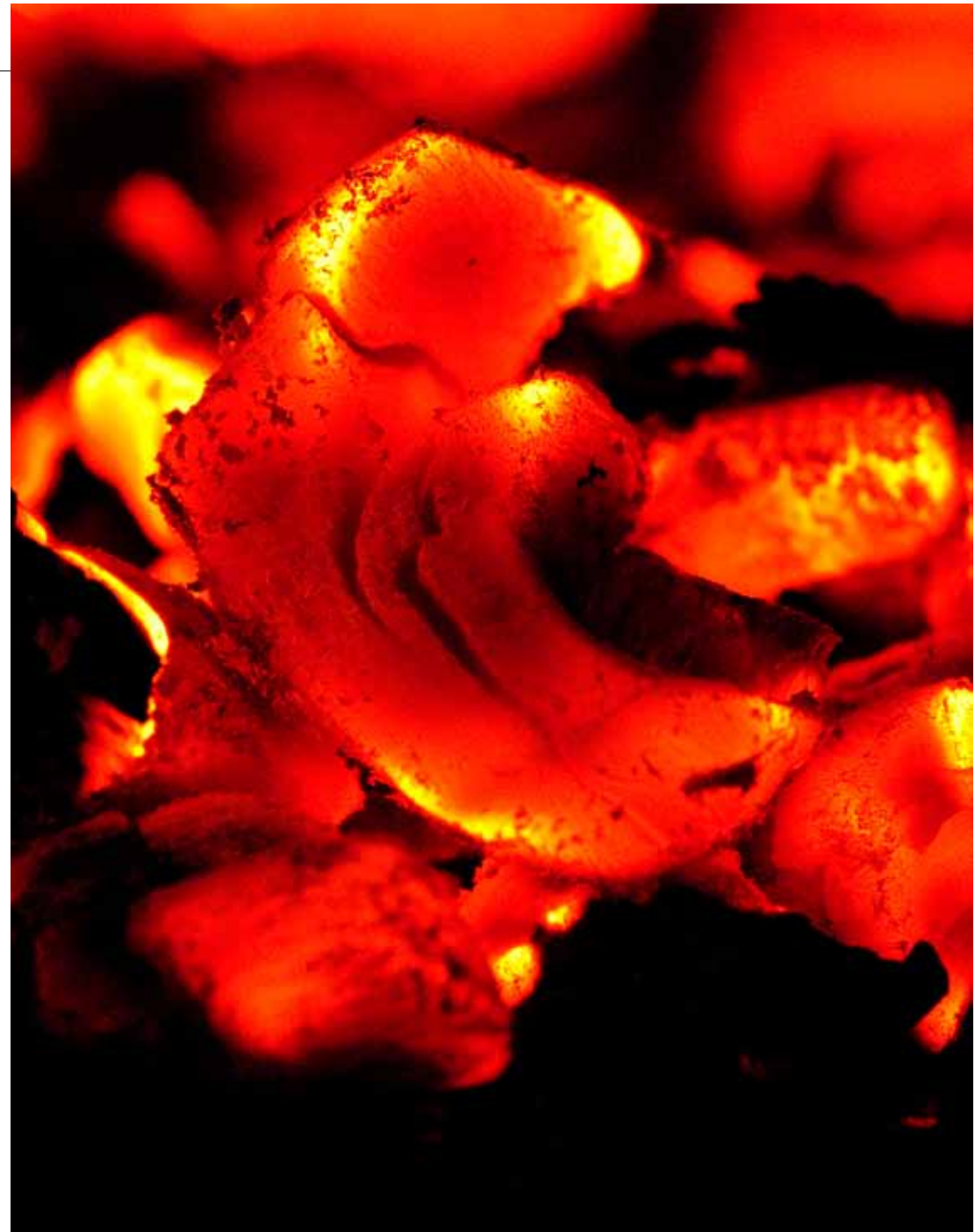
As recently as 20 years ago top chefs across the world took their cue from classic French cuisine. Much has changed and new trends continued to emerge: Euro-Asiatic fusion, molecular gastronomy and purist, so-called “Nordic Cuisine”. Each vogue has left its trace. Dishes are lighter and produce is more varied: chefs can choose from a multitude of ingredients and make use of novel techniques. Dishes are constructed to form a complex tapestry of aromas and textures. Cooking meat at low temperature deserves special mention: meat retains its own subtle flavour and remains exquisitely tender. However, the strong roast or grilled flavours that used to carry potent red wines are now absent. White wines with structure but little weight, lacking overt primary aromas are in demand. Long maturation on the lees and 2-3 years of bottle age rounds wines and creates a broader mouthfeel, a canvas onto which the food flavours can be projected. Good examples are Grüner Veltliner from Austria, Grosses Gewächs Riesling from Germany and cool-climate Chardonnay or Sauvignon Blanc from the Old or New World. Top wines made from indigenous varieties in Spain, France and Italy offer compelling combinations. They will not have the linear structure of a Riesling, for example, but their own manifold aromas will weave into the flavour tapestry of the dish. Excellent examples are wines made from Doña Blanca and Godello from northern Spain, Roussanne and Marsanne from southern France or Greco Bianco and Fiano from southern Italy. The dominant flavour component of the dish should be mirrored in the wine. For slightly sweet ingredients like crustaceans just a little residual sugar in a wine can be fun. The choice of red wines depends on the cooking method of the meat. When roast and grilled flavours are absent the same maxim applies: structure without weight. Good examples are Pinot Noir and Merlot from the Old and New World, or Cabernet Franc from the Loire in France. Well-matured wines like Barolo, Chianti Classico, Rioja or Bordeaux offer the subtle and multifarious complexity of age.



BARBECUE As soon as late spring starts turning into summer barbecue season is upon us: marinated steaks, chicken drumsticks, kebabs, burgers and all manner of sausages sizzle over charcoal. Coleslaw, potato salad, grilled vegetables and sauces and dips in a rainbow of flavours make a veritable feast enjoyed in a convivial round.

Barbecue wine has to be uncomplicated but robust enough to stand up to the multitude of smoky, charred flavours as well as the spicy and often sweetish condiments. New World reds go well: Californian Zinfandel, for instance, is dry but its opulent fruit, elevated alcohol and toasty barrel flavours give an impression of sweetness. Equally suitable is a mouthfilling, velvety Argentinean Malbec, a clean, juicy-fruited Chilean red or a concentrated Australian red. Red wines from southern Italy or potent Spanish wines can also be recommended.

If lighter wines are preferred, rosé is a good option: spicy, dry rosés from Tavel in the Rhône Valley or Provence have backbone whereas Spanish rosés from Navarra or those from the New World are fruitier and can have some residual sweetness.



DESSERTS

Wine served with dessert should be slightly sweeter than the dish itself: sweetness paired with sweetness is easily offset and an overpowered wine would appear dull and aromatically flat. A wealth of dessert wines are made in countless styles and every conceivable degree of sweetness. Wines made from the Muscat grape taste and smell just like grapes themselves. Light, frothy Italian Moscato d'Asti is made from them and goes really well with simple fruit desserts and sorbets. Muscat de Rivesaltes from southern France is also suitable, albeit higher in alcohol.

Baked fruit desserts, like Tarte Tatin require more sweetness and concentration. With their ripe fruit flavours Jurançon, Vouvray, and Coteaux du Layon from France or Riesling Auslese from Germany are good matches.

Very sweet desserts with dried fruit, spices or caramel are best paired with very concentrated wines made from noble rot-affected (botrytised) grapes like Tokaji or Sauternes. These wines have a candied, nutty, honeyed taste and make an excellent match.

Dark chocolate-based desserts are ideally combined with fortified red wines like Port or Banyuls. This combination can be improved upon by adding a fruity component to the chocolate dessert: cherry compote works particularly well.

Most sweet wines have such intricate aromatic layers that a small glass of them could serve as a dessert in itself. In the Tuscan tradition a glass of Vin Santo is served after dinner with "Cantuccini", local almond biscuits which are dipped into the wine from time to time.



THE VINE

To understand the anatomy of the vine it is best observed in its natural habitat. The wood of the vine is not particularly sturdy and will always support itself by growing up a tree. The vine competes with this tree for water and nutrients in the soil. This explains its tendency to develop deep and intricate root systems. Above ground, the vine grows towards the light and develops abundant, long shoots to outcompete the tree, which explains its extraordinary vigour. Once the shoots reach direct sunlight the vine switches its focus to producing fruit. Grapes will attract birds which will disperse the seeds and ensure the survival of the species. A comfortably established vine will produce little fruit. Under stress, however, survival takes over and sweeter, more abundant grapes are produced.

In viticulture, pruning encourages the production of fruit that can then be harvested easily. All noble grape varieties like Riesling or Merlot derive from the European grapevine *Vitis vinifera*. In the 19th century, sailors brought wild American vines to European gardening enthusiasts but unwittingly transported a stowaway: phylloxera; an insect that feeds on vine roots. American vines were resistant but not their European counterparts which died quickly once attacked. The only way to ensure the survival of the European grapevine was to graft it onto American rootstock. This is still done today in vine nurseries. Depending on soil type, winegrowers today can choose between dozens of different rootstocks. The self-healing property of the vine makes grafting possible but a little scar tissue will always remain. This can reduce the sap flow between root and plant. Photosynthesised sugar from the leaves cannot travel unhindered to the roots, leaving more sugar in the plant and resulting in sweeter fruit. Grafting can thus have a positive effect on wine quality but also shortens the vine's life to about 45 years. Un-grafted vines can live up to 100 years.



THE IMPORTANCE OF THE LEAF

Without photosynthesis no plant could grow, let alone ripen fruit. Thanks to water in the soil, leaves containing chlorophyll and energy derived from sunlight, plants can turn carbon dioxide into sugars and oxygen. Vines store sugar, amongst other places, in their grapes which causes them to ripen. In order to ripen, each bunch of grapes requires a certain number of vine leaves sufficiently exposed to sunlight to produce sugars. Hence, the vine leaf is of central importance in viticulture.

Growers can strongly influence wine quality with expert canopy management. The first step is winter pruning which controls the ratio of leaves to fruit. The grower prunes back the vine and decides how many buds can remain. Each bud develops a shoot on which one or two bunches will form with leaves further along. Soil fertility and climate govern the vigour of these shoots. Fertile soils in warm climates can support more shoots since these develop sufficient leaves to “nourish” the grapes. The leaves need to get sufficient sunlight to produce sugars and an ideal canopy is no thicker than 30 centimetres.

For vines growing less vigorously on poor soils and yielding little fruit, one wire to support the canopy and tie shoots to is sufficient, like in Burgundy. Intricate training systems have been designed for vigorous vines, often found in the warmer regions of the New World. Half the shoots can be trained upwards, for example, the other half downwards to create a larger area of leaf surface.

In hot and sunny regions photosynthesis does not pose a problem but grapes have to be protected from sunburn. In this case, special training systems like the “California Sprawl”, where some shoots trail downwards, allow shading of the fruit.



RIESLING Riesling is amongst the world's most noble grape varieties. It achieves its most intense expression in cool regions whose extended growing seasons ensure long, slow ripening. This allows for aromatic development and retains fresh acidity. The largest area planted to Riesling is in Germany, followed by Australia, Alsace, America, Austria and New Zealand. Typically, Riesling has floral notes, stone fruit aromas and racy acidity. It can be made dry or with varying amounts of residual sugar, unlike Chardonnay or Sauvignon Blanc which are always made dry.

Sweetness in Riesling accentuates its fruit flavours and balances its acidity but for consumers it is frequently hard to tell if a wine is dry, off-dry or sweet. Unlike Chardonnay, Riesling is never made or matured in new oak and thus never shows any wood or vanilla flavours.

German Riesling is particularly varied. There are many styles: from dry, almost austere Rheingau Riesling, with its backbone of acidity, to classic, fruity and light-footed Mosel Riesling. Wines without residual sugar – in reality up to 9 grams per litre – are labelled “trocken”.

Rieslings from Australia's Clare or Eden Valleys are bone-dry, show zesty lime fruit paired with kerosene notes and a sharp but balanced acidity. New Zealand Riesling is less pungent than Australian Riesling and often comes with residual sweetness. Austrian Riesling is mostly dry and expressive. Alsace Riesling is earthy in character, full-bodied and often has distinct sweetness. Riesling from Washington has particularly expressive stone fruit flavours and frequently some residual sugar.

Certain conditions favour the development of kerosene notes in Riesling grapes: this is usually the case when the vine experiences stress like drought, elevated temperatures, poor soils or when fruit is exposed directly to sunlight. In most Rieslings such notes become increasingly apparent with age as other aromatic elements become less intense.



PINOT NOIR Red Burgundy made from Pinot Noir and red Bordeaux made chiefly from Cabernet Sauvignon represent the two archetypes of red wine. Cabernet is relatively unfussy, grows in various but mostly warm regions and is often blended with other grape varieties. Sensitive Pinot Noir is its polar opposite: it requires a cool climate to avoid being dull and jammy and demands near superhuman winemaking skills; it takes experience and delicacy to make an exquisite wine.

Pinot Noir has thin-skinned grapes with few phenols, which explains the often lighter colour and softer tannin structure of the wines. Fresh acidity and red berry notes are typical. Only superlative wines have the unmistakably complex, ethereal and constantly changing perfume reminiscent of red berries, cherries, wild strawberries, eglantine, aromatic herbs, undergrowth, tea and mushrooms. Cabernet is all about power, while Pinot Noir is about finesse. Pinot Noir is an ancient grape variety prone to mutation. This not only creates various clones but also completely new grape varieties. Like white Pinot Blanc, for instance, and pink-skinned Pinot Gris, both derived from Pinot Noir. A grower can choose between dozens of clones when planting a new Pinot Noir vineyard. During the 1950s big-berried clones giving large yields were popular, among them the so-called “Pinot Droit” of Burgundy. These made very fruity wines but lacked structure; the German “Freiburg” clone is another example. The so-called “Dijon” clones have small berries and are grown for top-quality wines all over the world.

Burgundy is the cradle of Pinot Noir and its wines are still seen as a stylistic paradigm. The Côte d’Or can produce highly complex, silky and fragrant wines. New Zealand produces impressive wines with precise fruit and mineral background in the cool regions of Martinborough and Marlborough, while Central Otago with its extreme temperature swings has plummy, mocha-like Pinot Noirs with astonishing power and handsome tannins. The cool regions of California and Oregon make a more rounded style of Pinot Noir, with juicy fruit and gently extracted sweetness.



THE HARVEST

The winegrower can harvest grapes in two ways: by hand or by machine.

During hand harvest, whole bunches are cut off the vine and placed in small crates. This is gentle, avoids squashing the grapes and prevents their juice from leaking out: undamaged grapes will not oxidise, neither can phenols (tannins and pigment) be inadvertently extracted into leaking juice. What is more, human hands and eyes can tell healthy from rotten grapes and select accordingly. The best grapes are thus picked by trained harvest staff.

However, seasonal workers are not always available and hand harvesting is expensive and slow. This can pose a problem when poor weather is forecast and the crop cannot be harvested in time.

During machine harvest a large machine drives along the vine rows, agitates the vines and shakes the berries off their stems onto a conveyor belt. Large vineyards can be harvested very quickly and even night harvests are possible so grapes can reach the winery much cooler. This is especially important in hot regions: a spontaneous fermentation of warm must is tumultuous, irrepressible and very undesirable.

However, machine harvests are not gentle: the grapes can easily oxidise and heavy machinery compacts the soil. Neither can the machine distinguish between healthy and rotten grapes.



WITH OR WITHOUT STEMS?

A bunch of grapes consists of a central stem and berries. The winemaker decides if the wine is made from whole bunches or just from the berries. The stems can be mechanically removed with the aid of a de-stemmer and the presence or absence of stalks influences the wine's taste.

Stems contain a lot of tannin and some winemakers exploit this when making red wine, especially for varieties naturally low in tannin like Pinot Noir. The winemaker also decides how many stems are added to the must. Fermentation on the skins can last up to 3 weeks so stems have to be ripe and well lignified to prevent leaching of green aromas and harsh tannins. The addition of stems lends the wine a more robust tannin structure and soft menthol note but they also absorb some colour and alcohol. Red wines fermented without stems are fruitier and have a darker colour.

When white grapes are to be processed very gently, their whole bunches are carefully pressed immediately upon harvest. The juice is delicate and clean as no tannin (and colour) is extracted from the skins. This is particularly important in Champagne where white wine is made from red grapes by whole-bunch pressing. When white grapes are de-stemmed they are either pressed immediately or they undergo a period of skin contact. Here de-stemmed berries macerate in their juice at low temperature to leach aroma compounds from the skin. This is common for aromatic varieties like Riesling or Sauvignon Blanc and often results in a slight phenolic flavour in the wine.



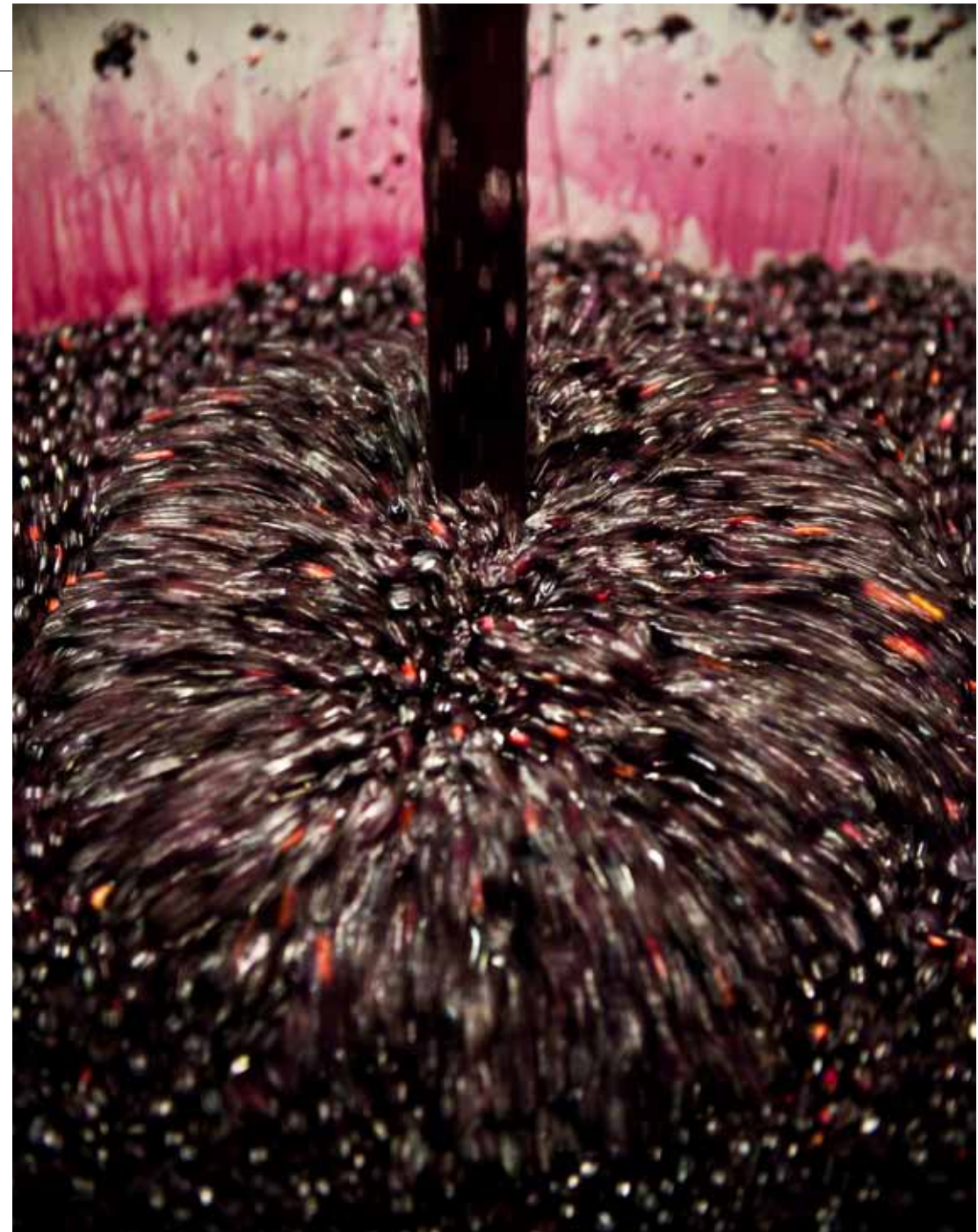
HOW RED WINE IS MADE

Red wine is made by fermenting grapes on their skins in order to extract colour and tannin out of them. Indeed, all grapes whether red or white have colourless pulp and juice.

Once harvested, the winemaker decides if the grapes are to be de-stemmed before being placed in the fermentation vessel. Maceration begins whereby various compounds are leached from the skins at differing speed. Pigment and aroma compounds are located in the softer cells of the inner skin layer and are easily extracted; unlike the tannins located in the robust outer skin layer which only become soluble with increasing alcohol levels. These properties can be exploited to influence the style of the wine.

Some winemakers cold-macerate their wines before fermentation: crushed grapes are kept for up to five days at low temperature to prevent yeast activity. Yeasts only become active at around 15°C (59°F). During this cold maceration (or “cold soak”) mainly aroma compounds and colour are extracted but hardly any tannins. The resulting wine is more fruit-dominated and darker in colour. Once fermentation begins, alcohol, heat and carbon dioxide are formed. Heat and increasing alcohol facilitate a more effective maceration while small carbon dioxide bubbles rise to the surface and cause the grape skins to form a cap.

This cap must be mixed regularly with the fermenting liquid to ensure optimal extraction. “Pigeage” is the French term used for mechanically submerging the cap in the liquid. This is done by hand or machine using plungers or paddles



OAK CHIPS New barrels are expensive and using them for entry-level wines is not cost-effective. However, oak flavours of vanilla and caramel are so popular with consumers that the idea of imparting them by using affordable oak chips is very attractive. A mere 300g of oak chips per 100 litres of wine are required to simulate the flavour given by a new barrique. Calculated as cost per litre, oak chips come to just one cent per litre of wine whereas a new French barrique weighs in at 2.90 Euros per litre.

Oak chips are made from cooperage off-cuts and are available in different toast grades. Their use has been legal in Europe since 2006 even though they can only be added to wine after fermentation.

In order to integrate oak flavours and tannins into wine, the minute ingress of oxygen that usually happens in barrel is essential. This can be achieved by maturing wines with oak chips in used barrels. Wine matured with chips in an airtight stainless steel tank can make use of micro-oxygenation which rounds tannins and stabilises colour. Here, oxygen is pumped into the wine via a ceramic cylinder which releases microscopically small oxygen bubbles into the wine.

Apart from chips, whole oak staves can be used. New World countries permit the use of chips, staves and even oak powder; however, the use of liquid oak extract is only permitted in China and the United States.

