

# Glossary of Terms for Enology, Viticulture and Winemaking

<b>2,4,6-Trichloroanisole (TCA)</b>	Compound associated with “corky” wines.
<b>Acetic acid (HAc)</b>	An organic acid present in all wines. In excess, smells like vinegar.
<b>Acetic acid bacteria</b>	Aerobic bacteria that frequently causes wine spoilage by producing HAc and EtAc.
<b>Acetification</b>	The oxidative conversion of wine to vinegar, EtOH to HAc. An aerobic fermentation by <i>Acetobacter</i> .
<b>Acetobacter</b>	Acetic acid bacteria that forms a film on wine’s surface. These bacteria need oxygen.
<b>Acidity</b>	The concentration of nonvolatile organic acids in must and wine. The sour or tart taste in wine and other food. The primary natural acid in grapes and wine is Tartaric acid; the second most abundant is Malic acid. Sometimes referred to as the “backbone” of a wine, acidity contributes to a wine’s aging ability.
<b>Acidulate</b>	When a wine is too low in acid. The winemaker can add acid to improve the balance. The levels of acid to add are first tested with acid series in the lab. Sometimes, if the TA is too low, the winemaker may add acid to the grapes prior to fermentation. Tartaric acid is the primary acid used. Caution must be exerted, because addition of tartaric acid might affect the cold stability of the wine. Citric acid can also be used, but it does give as pure a taste.
<b>Advection fog</b>	Fog which forms in shallow horizontal layers when warm, moist air is cooled from below, usually by passing over cold water. This type of fog is typical along west coasts of the world’s continents in summer. California, Chile and France are example wine growing regions whose climate is tempered by advection fog, which greatly improves their wine quality.
<b>Aerobic reaction</b>	Only takes place in the presence of oxygen.
<b>Aftertaste</b>	The “shadow taste” remaining in your mouth just after swallowing a sip of wine. Important in wine tasting because it can reveal an extra attribute or fault.
<b>Aging</b>	Change of wine chemistry after fermentation. Term describing the storing of wine under certain specific conditions for the purpose of improving the wine. Aging of wines (usually reds) for long periods in oak barrels adds oak-flavor and makes the wine more complex. After bottling, further aging in sealed bottles develops a pleasing taste and odor characteristic called “bottle bouquet.” Bottle bouquet usually begins to develop in bottled wine three or four years after bottling, and develops in both red and white wines.
<b>Alcohol</b>	Many different compounds in nature are classed as “alcohols” chemically. In wine only one exists in significant amounts: ethyl alcohol, or “ethanol.” Other alcohols, if present, occur

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	only in minute amounts and are usually thought of as flavor components. Ethyl alcohol adds a sweetish taste to wines, or "hotness" if present in too high a concentration. Conversely, if its alcohol content is too low, a wine may be thin, unbalanced and lacking in body.
<b>Alliers</b>	Forested region in central France from which come oak barrels. The department of Alliers contains the forest of Tronçais. The wood is generally tighter-grained than oak from other regions.
<b>Amelioration</b>	Must adjustment...dilution with water, increasing sugar content, increasing acid content, etc.
<b>American hybrids</b>	Grape varieties which were produced in by crossbreeding (usually crosses between one or more native American varieties and one or more European traditional wine varieties).
<b>Ampelography</b>	A book that describes the structural characteristics of various varieties of grape vines. Used for identification of vine varieties in the field.
<b>Anaerobic reaction</b>	Only takes place in the absence of oxygen.
<b>Appearance</b>	A term used in sensory evaluation of wine to describe whether a wine is crystal clear (brilliant), cloudy, or contains sediment. In this context, it has nothing to do with color.
<b>Appellation controlee AOC)</b>	French wine laws that dictate which varieties can be planted in specific regions, certain production methods, etc.
<b>Appellation</b>	A term used to describe the vineyard location where the grapes were grown for a specific wine. It can refer to a broad region, such as Napa Valley in California or Bordeaux in France. Or, it can refer to a more tightly defined sub-region like Oak Knoll within Napa Valley or Médoc within Bordeaux.
<b>Anion</b>	A negatively (-) charged ion.
<b>Anthocyanins</b>	Colored forms of tannins. From grape skins. Gives red wines their color.
<b>Antioxidants</b>	Compounds reacting readily with oxygen, limiting oxidation of other wine or cellular compounds.
<b>Aramon</b>	A European wine grape best known not for its wine quality but for its original use as a parent in producing the hybrid rootstock AXR-1. AXR-1 was the predominately used rootstock in California's coastal counties during the mid to late 1900's until a new biotype of the Phylloxera root aphid appeared. That biotype was able to attack and kill AXR-1 grapevines, and AXR-1 is no longer recommended for use in commercial vineyards.
<b>Argols</b>	Name given to raw cream of tartar crystals found in chunks

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	adhering to the inside walls and bottoms of wine tanks. Historically, the primary source of the world's cream of tartar used in cooking and manufacturing has been this by-product of wine production.
<b>Aroma</b>	Fragrances in wines originated from grapes.
<b>Assemblage</b>	The blending together of component wine lots to form a final composite intended for bottling, for aging, for sparkling wine production or some other use by the winemaker.
<b>Astringency</b>	A dry, puckery, chalky tactile sensation in the mouth, caused by tannins and acids.
<b>Atmosphere (atm)</b>	Unit of measure for pressure inside a bottle of Sparking Wine or Champagne. 1 atm equals 14.7 pounds per square inch (the standard atmospheric pressure at sea level in the world). Commercial sparkling wines commonly contain 4 to 6 atmospheres of CO <sub>2</sub> pressure at room temperature.
<b>Autofermentor</b>	A fermentor with automatic periodic punch downs of caps.
<b>Autolysis</b>	Progressive breakdown of walls of dead yeast cells. Liberates nitrogenous compounds and amino acids which positively affect structure and taste of wines. Mostly in sparkling wines prior to disgorgement or wines in barrels aged <i>sur lie</i> prior to racking.
<b>Bacterial</b>	A tasting term often used by wine judges to describe wines with unpleasant, but ill defined off odors or flavors.
<b>Baking</b>	In wine this term refers to the process of producing Sherry-like wines by deliberately oxidizing a wine through heating and aerating it for a period of several weeks. It is not uncommon for the process to take place over a 4 to 6 week period at 135 °F (57 °C).
<b>Balance</b>	A subjective term used in wine evaluation. A wine in which the tastes of acid, sugar, tannin, alcohol and flavor are in harmony is said to be in balance.
<b>Balling</b>	The name of a density scale for measuring sugar content in water solutions. Since grape juice is primarily sugar and water, the balling scale was used for a quick and easy "sugar analysis" of juice. The original Balling scale contained a slight inaccuracy however. Dr Brix (pronounced bricks) discovered that and corrected it. Today the Brix scale is in actual use, but the terms Balling and Brix often are spoken of as if they were identical. The Balling (Brix) scale is simplicity itself: Each degree is equivalent to 1 % of sugar in the juice. For example, grape juice that measures 15.5 ° on the Balling or Brix scale will have 15.5% sugar.
<b>Barrel</b>	Wood container with arched sides used to age all wine and or ferment white wine. Normally about 225 liters or 60 gallons.

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<b>Barrel fermentation</b>	Wine fermentation conducted in barrels.
<b>Barrique</b>	225-liter oak barrel, originally from Bordeaux.
<b>Baumé</b>	French system for gauging potential alcohol of a wine by measuring must weight. Used for deciding harvest date. 1° Baumé is approximately 1.8° Brix.
<b>Bead</b>	A colloquial term referring to the bubbles that floats in groups on top of a fermenting wine or Champagne/Sparkling Wine in the glass.
<b>Bentonite</b>	A purified natural montmorillonite clay that is used in fining white wines for the purpose of correcting heat instability. When stirred into a white wine, the Bentonite particles quickly adsorb the larger molecules of protein in the wine, collecting them as the Bentonite settles to the bottom of the wine tank. Later, the act of removing the Bentonite from the tank by racking or filtration removes the excessive protein from the wine. It was these larger proteins in the wine that had caused heat instability, so Bentonite treatment corrects the original heat instability of the wine. Bentonite is never used for red wines because the red pigments of wine tend to stick to the Bentonite also. Heavy Bentonite use in red wine would effectively destroy the red color of the wine. Plus, red wines, because of their tannins, do not have unstable Bentonite problems.
<b>Binning</b>	Storage of newly bottled wine or Champagne in bins -- for bottle aging prior to labeling and shipping to market.
<b>Bitter</b>	Subjective tasting term. Bitterness usually comes from excessive tannin in wine and is sensed by taste buds on the tongue.
<b>Blending</b>	The mixture of different lots of wines for various reasons.
<b>Bloom</b>	The grape flower, or blossom. The term also refers to the time of grape flowering in the spring. It is also the grayish, powdery film that occurs on grapes in the field, and which contains wild yeast and dust. Brush your finger across the skin of a ripe grape and you'll see this bloom easily.
<b>Blush wine</b>	Another term for Rosé.
<b>Body</b>	A tactile perception of weight of wine on the palate. A tasting term referring to viscosity, thickness, consistency, or texture. A wine with "body" often has higher alcohol or sugar content than others. Tannin, also, is a major component of what we call "body" in wine.
<b>Bordeaux mixture</b>	A fungicidal spray prepared from copper sulfate and calcium hydroxide (slaked lime) in water.
<b>Botrytis cinerea</b>	Latin names of the fungus that causes noble rot ( <i>pourriture noble</i> in France or <i>Edelfäule</i> in Germany). Attacks ripening

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	grapes when morning mist and warmth provide humid conditions for its development. The mold shrivels the grapes and reduces the moisture content, hence increasing the sugar content.
<b>Botrytized wine</b>	Wines produced from grapes infected with <i>Botrytis cinerea</i> .
<b>Bottle Age</b>	Characteristic of maturity developing in a bottle. A sign of quality.
<b>Bottle sickness</b>	A temporary oxidized character of a wine exposed to oxygen during bottling. The free sulfur dioxide content is reduced and may take several weeks to stabilize. The wines seem lifeless.
<b>Bouquet</b>	Fragrances in wines resulting from fermentation, storage and aging.
<b>Brandy</b>	The alcoholic liquid obtained from distillation of wine.
<b>Breathing</b>	Describes the time between opening a bottle of wine and drinking it. The wine is exposed to air.
<b>Brettanomyces</b>	Commonly known as Brett. This is yeast that is normally viewed as a spoilage organism. It is thought to give complexity to some wines.
<b>Brilliant</b>	A sensory evaluation term to describe a wine that is crystal clear and absolutely free from sediment or cloudiness.
<b>Brine</b>	A liquid used in refrigeration systems.
<b>Brix</b>	Pronounce this word to rhyme with bricks, not the 'pree' of Grand Prix. °Brix is the unit of measurement for density, or soluble solids in ripening grapes. Since sugar makes up nearly all the soluble solids in fresh grape juice, and soluble solids give the juice its density, any measure of the density of the juice is also a measure of the "sugar content." So, the simple act of measuring the density of juice is equivalent to doing a much more complicated chemical analysis of the sugar content in the juice. A reading of one-degree Brix equals one percent sugar in the juice.
<b>Browning</b>	An undesirable increase in the brownish color of a wine due to oxidation of phenolic compounds.
<b>Bud break</b>	Also Bud Burst. The action of new vine buds swelling, opening and beginning new vine growth in spring.
<b>Bud</b>	Small swelling on a grapevine shoot or cane from which a new shoot develops.
<b>Brut</b>	French term referring to the driest (least sweet) Champagne. Pronounce Brut to rhyme with foot. Brut is always drier (less sweet) than "extra dry."
<b>Bunch Thinning</b>	Selective removal of a portion of a crop, usually at or around <i>véraison</i> .

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## Bung

The closure used to seal a wine container. Generally made from wood or silicon rubber.

## Bunghole

The hole in the side of a wine barrel through which the barrel is filled and emptied. In barrel manufacture, coopers always use at least one very wide barrel stave (the bung stave) somewhere in the group of staves making up the circumference of a barrel. Bung staves have to be wide enough to allow boring the bunghole without affecting the strength of that stave.

## Cambium

The layer of active, living tissue under the bark and phloem tissue of a grape vine. New woody cells (xylem tissue) form at the inside of cambium as it grows, while new phloem and bark cells form at the outside edge. The net effect of this growth is to increase the diameter of the trunk or cane of a vine by adding exactly one "growth ring" to the diameter.

## Cane

The mature (tan or brown, not green) shoot of a vine. If the color is green, it's a shoot; if the color is brown, it's a cane.

## Cap

The collection of skin, pulp and seeds, and maybe stems, rising to the top of a red wine fermenter as a result of the CO<sub>2</sub> produced during fermentation. The floating solids bind together forming a thick mat, which must be wetted at least daily during fermentation of red wine in order to extract the maximum amount of color and flavor from the skins into the wine. Failure to wet the cap during fermentation usually produces lighter, less flavorful and less tannic red wines, which have a shorter shelf life. It can also result in bacterial growth in the cap. Also, a tiny green cover on an individual, unopened grape flower in a cluster on the vine. The cap loosens and then falls off, exposing the pinhead-size, female ovary and releasing the yellow, pollinating (male) anthers of an individual grape flower. When this cap falls off, allowing the yellow anthers to open, the flower is said to be in bloom.

## Cap stem

The small length of stem that connects each individual grape berry to its bunch.

## Capacity

The quantity, as opposed to quality, of grapevine growth and total crop produced and ripened. See also vigor, which is used in contrast to capacity.

## Carbohydrate

The technical name for a class of compounds composed of carbon along with hydrogen and oxygen in their 2:1 ratio of water. Carbohydrates are made by grapevines and used to store and move energy around inside the vine. Sugar is the soluble (mobile) form and starch is the insoluble (storage) form of carbohydrate in vines.

## Carbon dioxide (CO<sub>2</sub>)

A heavy gas that occurs naturally in air. It gives carbonated drinks their bubbles and, as dry ice (frozen CO<sub>2</sub>), it is used to keep things very cold. Vine leaves produce sugar from CO<sub>2</sub> and water, using sunlight as their source of energy. This sugar is the ultimate source of energy used by the vine for growth and

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	grape production. It is also a primary byproduct of alcohol fermentation.
<b>Carbonation</b>	The injection of carbon dioxide gas into a beverage under high pressure.
<b>Carbonic maceration</b>	Known in France as <i>macération carbonique</i> . Fermentation method using whole bunches of grapes which begin to ferment inside their skins in a CO <sub>2</sub> saturated atmosphere. From the weight of the grape bunches, juice collects at the bottom of the fermenter and it extracts color from the broken skins. No tannin is extracted. Fermentation generally finishes after the grapes have been pressed, resulting in low tannin, fresh red wines. This is the process commonly used to produce “nouveau” wines of the Beaujolais region of France.
<b>Casse</b>	Haziness caused by creation of complexes between metal salts with some organic acids, proteins or phenolic compounds. The term is almost never used in the industry.
<b>Catechin</b>	The major type of monomeric flavonoid tannin; isolated primarily from grape seeds; consists of two optical isomers of flavan-3-ols.
<b>Cation</b>	A positively (+) charged ion.
<b>cDNA</b>	A chemically synthesized strand of DNA (deoxyribonucleic acid) complementary to a segment of RNA (usually a mRNA transcript) of a structural gene.
<b>Cépages noble</b>	French term for the group of “greatest grape varieties” used in winemaking.
<b>Centrifuge</b>	A desludging centrifuge consists of a stack of truncated cones mounted on a hollow spindle in the center of a bowl. The incoming juice or wine enters through the spindle at the top. The fluid cascades down through the cones to the bowl bottom. The spindle rotates at high speeds producing outward radial forces on particle in the fluid of >5,000 times that of gravity. The fluid at the bowl bottom is forced up between the disc and leaves through the top. Any particles in the fluid are collected on the underside of each disc. After enough solids have been collected, the fluid inflow stops and the solids are desludged through ports on the side of the bowl. The bowl reseals and fluid inflow proceeds and the operations repeat. Centrifuges are mainly used to reduce solids on white and pink juice prior to fermentation, for stopping fermentation by reducing yeast populations and giving a “rough” clarification to wines prior to filtration.
<b>Chaptalisation</b>	Addition of sugar to fermenting must to increase alcohol content. It is illegal in California and Oregon, but is permitted by U.S. law and by other nations of the world.
<b>Charmat process</b>	Also called <i>cuve close</i> . A process for producing sparkling wine cheaply and in large quantities by conducting the secondary

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	<p>fermentation in large tanks rather than individual bottles. After the second fermentation is completed, the wines are filtered; the appropriate <i>dosage</i> is added, and the wines are bottled. Eugene Charvat, a Frenchman, developed the process in 1910. It is widely used all over the world for making every day, lower priced sparkling wines.</p>
<b>Chloroplasts</b>	<p>Oval, chlorophyll-bearing structures inside the cells of leaves. Chloroplasts act as tiny factories within the leaves -- to produce sugar for plant growth from CO<sub>2</sub> and water. The energy used for this conversion is sunlight, captured by the chlorophyll.</p>
<b>Clarity</b>	<p>In wine evaluation, clarity is a subjective term for the absence of cloudiness or sediment in a wine.</p>
<b>Clone</b>	<p>The descriptor name used for a group of vines all descended from the same individual vine. One single vine, if found to have especially desirable characteristics, may be propagated by grafting or budding to produce a whole vineyard that is identical to the original vine. The offspring vines from such a unique source are collectively referred to as "a clone" of the mother variety.</p>
<b>Closed-top tanks</b>	<p>Fermentation tanks with permanent tops. These always have doors or vents in the top to facilitate cleaning and for monitoring fermentations.</p>
<b>Cloying</b>	<p>A tasting term meaning the wine is difficult to enjoy because of excessive sweetness which "stays in your mouth" after the wine is gone.</p>
<b>Cluster</b>	<p>A "bunch" of grapes, all on a common stem.</p>
<b>Coarse</b>	<p>A wine tasting term referring to an unfinished, rough or crude wine which is difficult to drink.</p>
<b>Cold stable</b>	<p>A wine that can be kept in a refrigerator without forming sediment or crystals is said to be cold stable.</p>
<b>Compound bud</b>	<p>The normal type of bud that appears at each node along a vine shoot or cane. It contains not one but three separate, partially developed shoots with rudimentary leaves in greatly condensed form. Usually, only the middle one grows when the bud pushes out in the spring. The others break dormancy only if the primary shoot is damaged or other abnormality occurs.</p>
<b>Copper Sulfate</b>	<p>A compound used for removing H<sub>2</sub>S and thiols from wine.</p>
<b>Cold settle</b>	<p>Natural clarification of white or pink juice after pressing and before starting fermentation.</p>
<b>Cold stabilization</b>	<p>Chilling wine to temperatures just above freezing to precipitate tartrate crystals. This makes a wine cold stable.</p>
<b>Colloid</b>	<p>Macromolecules (i.e., soluble proteins), or molecular</p>

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	complexes (i.e., clay) dispersed in a medium (e.g., wine) by random, heat-induced (Brownian) molecular movement.
<b>Color density</b>	The sum of absorbency of a wine at 420 and 520 nm ( $E_{420} + E_{520}$ ) as measured in a spectrophotometer.
<b>Color stability</b>	The long-term retention of a wines young color; favored by lower pH, oxygen exclusion, and (for red wines) anthocyanin polymerization with tannin.
<b>Concentrate</b>	Grape juice with most of the water removed via vacuum distillation until the resulting sugar is 68 °Brix. It is generally used to sweeten wines prior to bottling.
<b>Condensed tannins</b>	Covalently bonded polymers of flavonoid phenolic; they do not hydrolyze readily.
<b>Cooperage</b>	A wooden container in which wine is fermented or aged. Made by a cooper.
<b>Copigmentation</b>	The weak association (stacking) of anthocyanins in complexes ion association with other compounds that can significantly change hue created by the pigment.
<b>Cork</b>	The name given to the suberose parenchyma, or bark, of the cork oak. In the 17 <sup>th</sup> century, Dom Pierre Pérignon is credited with substituting wooden stoppers wrapped in hemp soaked in olive oil with cork stoppers. Cork is especially well suited for this purpose because of its waxy composition, inertness and springiness.
<b>Corky or Corked</b>	A moldy off-odor most commonly associated with the presence of TCA. TCA arises from mold growing on or very near a natural cork after chlorine had been used to bleach and sanitize it. TCA is harmless but has a potent, musty, moldy smell and can give wine a bitter taste. Concentrations of TCA as low as 3 parts per trillion can taint a wine.
<b>Cream of tartar</b>	A natural component of grape juice and wine. The chemical name is potassium bi-tartrate. Removed from wine as a by-product, cream of tartar is used in cooking and as a component of baking powder.
<b>Cremant</b>	A category of champagne or sparkling wine that contains less carbonation than standard champagnes or sparkling wines. Cremant Champagnes are usually quite light and fruity.
<b>Crisp</b>	Tasting term to describe good acidity and pleasant taste without excessive sweetness.
<b>Crown cap</b>	A lined metal closure used to seal bottles. The edges are crimped around the lip of the bottle. Used in production of sparkling wine and for beer and soft drink bottles.
<b>Cru</b>	French word for growth. It refers to a vineyard of especially high quality, such as a classified growth or “cru classe.”

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<b>Crush</b>	The process of crushing and destemming wine grapes just prior to fermentation. "The crush" refers to the autumn season when grapes ripen and are harvested and fermented.
<b>Crush tank</b>	The wine tank that receives the newly crushed must -- pumped there directly from the crusher.
<b>Crusher-stemmer</b>	A device that crushes grapes (generally with rollers) and then removes stems with beaters revolving in a perforated cylinder. In French, they are called <i>fouloir égrappoir</i> .
<b>Crushing</b>	The breaking of grape skins. The juice inside the berry, as well as the seeds and broken skins are then freed for further processing. The crushing should be done as gently as possible.
<b>Cryoextraction</b>	The selected partial freezing of grapes to allow a predetermined level of juice concentration (via water removal as ice), followed by cold pressing.
<b>Cultivar</b>	Cultivar originally meant a "cultivated variety," but is now in such regular use that some say the word for varieties that are not cultivated, as well.
<b>Cultured yeast</b>	Lab-bred strains of natural yeast. Usually subtle in flavor and resistant to higher levels of alcohol or sulfur dioxide in wine.
<b>Cutting</b>	A piece of grape vine, usually 10 to 20 inches long, cut from a dormant vine in wintertime for use in propagating new vines in spring. Cuttings are taken only from last year's growth (never two-year old wood) and are a convenient way to store and handle the vine buds. It is the buds on the cutting that have the ability to begin new vine growth next year. Grafted or budded properly, each bud can become a new vine that is genetically identical to all the other vines from the original vine.
<b>Cuvée</b>	The blend of wines in which the second fermentation occurs in making sparkling wines.
<b>Deacidification</b>	The reduction in total (titratable) acidity by any of a series of biological, physical or physiochemical means.
<b>Dealcoholization</b>	The reduction in alcohol content by removing ethanol after its formation. The most methods are reverse osmosis and spinning cone.
<b>Decanter</b>	Works on the use of centrifugal force like centrifuges do, but at a few hundred times that of gravity. Decanters have cylindrical shells with a long conical end containing a large pitched screw. Both the shell and screw rotate at high rpm's in the same direction. The screw rotates at a few rpm's faster than the shell. The solids line the wall and are scraped off and discharged continuously as soft paste. The clarified liquid leaves continuously through ports at the other end. By changing the differential rotation speeds, solids removal rate is controlled. Decanters are used mainly on juice and lees

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	clarification.
<b>Dejuicer</b>	A device used to allow the escape of juice from crushed grapes before pressing begins.
<b>Delestage</b>	Involves draining out the fermenting juice from the bottom of the fermentation vessel into another vessel. The cap is then allowed to drain to near dryness for several hours. Then, by means of a gentle, low pressure pump, the juice is spilled back over the cap which again floats to the top of the tank. First, it aerates the fermenting juice which augments the final aroma profile. Second, this action allows for a greater color and flavor extraction from the source of these substances, the skins, and to a lesser degree, the seeds and stems as well. Finally, this process has the tendency to remove a certain percentage of the seeds from the whole system. Seeds are often the source of harsh and bitter tannins in wine, especially if they are cracked or become broken down.
<b>Demi-sec</b>	Champagne term signifying that the product is medium-sweet.
<b>Dessert wine</b>	Any of a class of sweet wines, usually fortified to higher alcohol content, which are served with desserts or as after dinner drinks. Common dessert wines are Ports, Sherries, Muscatel, Madeira, Today and Angelica.
<b>Diatomaceous earth (DE)</b>	Geologic deposits of the cell-wall remains of centric diatoms; used to filter wines.
<b>Disgorgement</b>	Known in France as <i>dégorgement</i> . One of the final steps in the production of sparkling wines by the <i>méthode champenoise</i> , by which the sediment is removed from each bottle before it receives its <i>dosage</i> and final cork.
<b>DJ</b>	A 5-gallon demijohn. Glass and synthetic. The most common “breakdown” container around a winery.
<b>Dosage</b>	The small quantity of aged wine or brandy, usually sweetened, added to sparkling wine immediately after disgorging.
<b>Downy mildew</b>	A fungal disease of grape vines, which kills the affected tissue. The disease is native to eastern North America and has spread to Europe and most other regions of the world. It does not occur in California because of the low humidity and lack of summer rains.
<b>Drain hopper</b>	A crush tank fitted with a screen to make free run juice separate quickly from the skins and stems in freshly crushed white grape must. By closing the drain valve for a specified time, the winemaker can “macerate” or allow contact between juice and solids for some varieties, if desired.
<b>Drained pomace</b>	In a crush tank, the solids left over after the juice has been drained off. This pomace is primarily skins with a small amount of stem bits.

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<b>Dry</b>	Having no perceived sweetness in wine. (<2 g/L)
<b>Dry pomace</b>	In a red fermenter, the solids left over from draining the new wine off after fermentation.
<b>Early Harvest</b>	These wines are produced in the coolest years when grape ripeness doesn't achieve full maturity. The wines are low in alcohol, light and easy to drink despite having high natural acidity.
<b>Earthy</b>	Sensory evaluation term for wine with a taste or smell reminiscent of soil, mushrooms or mustiness.
<b>Egg white</b>	Left over albumin obtained by discarding the yolks from eggs. Used in fining red wines after barrel aging to remove excess (usually bitter) tannin.
<b>Ellagitannins</b>	The primary hydrolysable tannins in wine; derived principally from wood containers.
<b>Enology</b>	The science and technical study of winemaking. From the Greek word for wine "oenos" (pronounced as if the first o isn't there -- "ē nus").
<b>Enzyme</b>	An organic molecule (usually a protein) that acts as a catalyst in one (or several similar) chemical reactions.
<b>Estate Bottled</b>	Label phrase meaning that the wine was produced and bottled at the winery from grapes owned (and farmed) by the winery owner. The term has lost importance recently because of many relaxations of the original, rigid TTB rules.
<b>Esterification</b>	The chemical processes by which esters are formed, involving interaction of oxygen with acids and alcohol.
<b>Esters</b>	Formed by reaction between acids in a wine and its alcohol. A low molecular weight (1- to 10- carbon) fatty acid ester. Flavorful and usually volatile. Over 100 different esters in most wines. Can contribute sweet fruity aromas.
<b>Ethanol (Ethyl alcohol)</b>	The type of alcohol produced by yeast fermentation of sugar under ordinary conditions. Chemically, C <sub>2</sub> H <sub>5</sub> OH. The alcohol in alcoholic beverages is always ethanol.
<b>Ethyl Acetate (EtAc)</b>	Formed by acetic acid bacteria in conjunction with HAC.
<b>Extra Dry</b>	In Champagne this term usually means "extra sweet." Only in Sherry can you rely on the term to mean that the wine is really dry.
<b>FAN</b>	An acronym for Free Amino Nitrogen. A combination of several alpha-amino acids. Along with ammonia, they give the yeast assimilable nitrogen (YAN), the nitrogen required by yeast.
<b>Fatty acids</b>	A long, straight hydrocarbon possessing a carbonyl (acid) group at one end.

# Glossary of Terms for Enology, Viticulture and Winemaking

<b>Fermentation</b>	Originally, "to boil without heat." The process, carried on by yeast growth in grape juice or other sugar solutions, by which sugar is transformed into ethyl alcohol and CO <sub>2</sub> . The CO <sub>2</sub> bubbles out of solution, giving the appearance of boiling without heat. An energy-yielding form of metabolism in which electron donors and terminal electron acceptors are organic compounds (oxygen is not required).
<b>Fermented "on the skins"</b>	A statement indicating that the wine was fermented with the juice and skins together -- the norm for red winemaking. Separation and discarding of solids is done only after the fermentation is completed. With very tannic grapes, the winemaker may draw the new wine away from the solids before the fermentation is fully complete (often at 3 to 4 degrees Brix).
<b>Fermenters</b>	Tanks, barrels or other containers when used for fermentations. Fermenters may be used after the fermenting season as normal storage tanks.
<b>Film Yeast</b>	Any yeast that can develop a hydrophobic (water repellent) wall, resulting in the formation of a floating colony (pellicle) on wine.
<b>Filter aid</b>	Material suspended in wine prior to filtering that settles and becomes part of the filter bed of a depth filter.
<b>Filters</b>	A mechanical means of clarifying wine and juice. An array of filter types exist; diatomaceous earth filters, pad filters, cartridge or membrane filters and cross-flow filters.
<b>Filtration</b>	Sieving process to remove suspended particles. Less gentle clarification than fining.
<b>Fining</b>	The act of clarifying or removing undesirable components from wine, such as excess tannins or dissolved proteins. This is usually done by adding a pure material that has the property of reacting with and removing the undesired component. Common fining agents for wine are egg white, gelatin and Bentonite clay.
<b>Fining agent</b>	A pure substance that may be added to wine for the purpose of removing some undesirable natural component that occurs in excess. For example, immediately after fermentation, red wines may contain excess tannin, which makes the wine too bitter or astringent. This can be removed by adding a very small amount of a protein such as egg white or gelatin. The protein attaches itself to the excess tannin and precipitates, falling to the bottom of the wine tank where it is later removed by decanting (racking).
<b>Finish</b>	The last impression left in the mouth by the taste of a wine.
<b>Finishing</b>	The last steps in processing a wine just before bottling, and may include bottling. Often, this includes fining, blending and filtration or centrifugation.

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<b>Fino</b>	Term found on some Sherry labels to denote the winery's lightest and driest Sherries.
<b>Fittings</b>	A host of clamps,
<b>Fitting board</b>	Where the fittings are stored and displayed. Always in the cellar.
<b>Fixed acid</b>	The organic acid content of wine that cannot be readily volatilized (removed) by steam distillation.
<b>Flash pasteurization</b>	Rapid sterilization of wine by heating and holding for 60 seconds at 90 °C (194 °F). This destroys yeast and bacteria in wine, stabilizes wine chemically and physically by coagulating certain heat-coagulable solids and hastens aging, particularly of ordinary dessert wines.
<b>Flabby</b>	A tasting term for a wine that is too low in acidity, too high in pH and difficult to drink.
<b>Flat</b>	Tasting term. Similar to flabby, a flat wine is lacking in acidity and crispness. Flat wines are difficult to drink and enjoy even if the flavor is good. In sparkling wines flat means the wine lacks carbonation.
<b>Flavonoid</b>	A phenolic compound based on two phenols bonded by a pyran carbon ring; in wine they primarily come from grape seeds and skin. (A pyran is a six membered heterocyclic ring consisting of five carbon atoms and one oxygen atom and containing two double bonds. The molecular formula is C <sub>5</sub> H <sub>6</sub> O.)
<b>Flavor</b>	A combined sensation of taste, touch, and odor of food and beverages.
<b>Flinty</b>	A tasting term used to describe white wine having a hard, austere, dry, clean taste.
<b>Flocculation</b>	The process by which some yeast strains adhere to one another, especially as the cells shift from exponential growth to stationary growth phase.
<b>Flor</b>	"Flower." A type of yeast that is able to float on the surface of a wine while growing and fermenting. The pellicle of film yeast that forms on the surface of the classic Fino Sherry wines of Jerez, Spain.
<b>Flowery</b>	A tasting term for wine with an exceptionally aromatic character reminiscent of fresh garden flowers.
<b>Fortified wines</b>	A category of wines to which brandy or high proof has been added. The best known fortified wines are port, sherry, Madeira and Marsala.
<b>Foxiness</b>	A tasting term to describe the smell and taste of Concord grapes and wine, and the smell and taste of similar varieties of

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	<p>the native eastern U.S. grapes <i>Vitis labrusca</i>. The aroma is attributed to formation of methyl anthranilate in ripe <i>labrusca</i> grapes.</p>
<b>Fragrance</b>	<p>The aromatic aspect of wine.</p>
<b>Free run juice or wine</b>	<p>The juice or wine that separates from must or pomace by draining alone (without pressing).</p>
<b>Fruity</b>	<p>Tasting term for wine that retains the fresh flavor of the grapes used in its fermentation. Sometimes older wines or wines that have undergone too much processing, can lose their fruitiness.</p>
<b>Fusel (higher) alcohol</b>	<p>A short-chain (3- to 5-carbon) alcohol possessing a pronounced fusel or petroleum odor. Isoamyl alcohol is an example. They can be important in brandy.</p>
<b>Gassy</b>	<p>A sensory evaluation term describing a wine that contains residual carbon dioxide left over from the fermentation. Not unpleasant in most white wines, but distinctly undesirable in reds because the CO<sub>2</sub> can exaggerate their tendency towards bitterness.</p>
<b>Generic wine</b>	<p>Blended wine of ordinary quality, without any varietal or other special characteristics. Usually named after a known wine region; like Burgundy or Chablis. Common term for an everyday, low price wine.</p>
<b>Green</b>	<p>A tasting term describing the grassy, herbaceous or vegetal taste of wines which were grown in too cool a climate. Unripe, green grapes in mid-season have this characteristic but it disappears as warm temperatures mature the berries to full ripeness. The greenness disappears as fruitiness appears with proper maturity.</p>
<b>Glycerol</b>	<p>An essential component of cell-membrane lipids (fats, or fatlike compounds); may contribute to a smooth mouth feel and viscosity of some wines.</p>
<b>Glycoside</b>	<p>An organic compound linked glycosidically (C-O-C) to one or more sugars.</p>
<b>Hang time</b>	<p>Leaving grapes to hang on their vines late without rain or irrigation develops high sugars as they dehydrate. The practice also produces wine with more intense but different flavors, higher alcohols and lower acidity, but there's little agreement whether it's better wine. And it's not at all clear if longer hang time harms the vines as some growers are suggesting.</p>
<b>Hard</b>	<p>A tasting term describing a wine that is excessively tannic, bitter or astringent and which lacks fruitiness.</p>
<b>Header-boards</b>	<p>Also known as heading-down boards. Means of keeping the cap submerged in a red fermenter.</p>

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<b>Headspace</b>	The volume of gas left in a container after filling and attaching closure.
<b>Heartwood</b>	The innermost portion of the woody tissue (xylem) making up the trunk of woody plants, such as grape vines or trees. Heartwood is composed of dead xylem cells that serve to give wood its strength. Even after the oldest xylem cells die, they perform a necessary function for the vine.
<b>Heat exchanger</b>	Device for rapidly cooling or warming wine, grape juice or must, often employing a shell with tubes inside.
<b>Heat summation</b>	A measure of the climate of wine growing regions. The heat summation for one day is calculated by subtracting 50 degrees from the mean temperatures for that day. The heat summation for a whole growing season is found by adding up the heat summations for every day of that growing season. The base temperature is 50°F, because not much biochemistry happens inside a vine below that temperature. Above 50°F the vine comes to life and grows, producing fruit, storing energy for next year's growth and does whatever else grapevines might want to do. We use heat summations to tell us which grape varieties to plant in a given location because experience has taught us that certain varieties tend to do best in cooler regions (lower heat summations) while other varieties do best in warmer locations.
<b>Hectare</b>	Metric unit of size for farmland everywhere but North America. One hectare is approximately 2.47 acres.
<b>Hectoliter</b>	Common unit of measure for wines in all European wineries. One hectoliter is 100 liters, or 26.42 U.S. gallons.
<b>Hemicelluloses</b>	Large polysaccharides that form a variable portion of plant cell walls; as source of sugars they may caramelize during the toasting of oak barrels.
<b>Herbaceous</b>	Describing an odor induced by the presence of above-threshold levels of several hexonols and hexanals, or certain pyrazines.
<b>High proof</b>	190 proof grape alcohol used to fortify wines.
<b>Higher alcohol</b>	A straight-chain hydrocarbon (three to eight carbons long) possessing a single alcohol (-OH) group; occasionally considered synonymous with fusel alcohols.
<b>Hock</b>	Originally an English term to denote wines which came from Hockheim, Germany. Today the term describes the unusually tall bottle that is used for Riesling and similar wines. Also, hock is a slang term referring to Riesling type wines themselves.
<b>Hose</b>	Wine is pumped through, generally, 2" hose. There are other sizes, too.

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<b>Hose rack</b>	Where the wine hoses are stored and allowed to dry. In the cellar.
<b>Hot</b>	Taste sensation often found in high alcohol wines. Table wines with hot taste are unpleasant to drink.
<b>Hybrid</b>	In viticulture, a hybrid is a new variety resulting from crossing two other (often very different) varieties.
<b>Hydrolyzable tannin</b>	A polymer of ellagic, gallic, or ellagic and gallic acid esters with glucose; in wine, it primarily comes from oak cooperage and is a polymer of ellagic acid esters (ellagitannins).
<b>Hydrometer</b>	Glass hydrometers are designed to float upright in liquid. Scale can be calibrated to read specific gravity or concentration of some specific solute at the defined temperature of calibration. For the wine industry they are scaled in °Brix. These are used for measuring grape sugar samples and fermentation status.
<b>Hyperoxidation</b>	The sparging of juice or must with oxygen, ostensibly to oxidize readily oxidizable phenols and promote their subsequent precipitation during fermentation.
<b>Ice wine</b>	Wine made from frozen grapes. The grapes are pressed while frozen and only the juice (never the solids) is used in the fermentation. Ice wines are always sweet, usually light and also delicate. Ice wines are almost always served as low alcohol dessert wines.
<b>Induced fermentation</b>	Inoculation of must with a known yeast strain. It is hoped this strain will dominate yeasts derived from grapes or winery equipment.
<b>Ingredient</b>	Any of the components of a mixture. Grape juice is an ingredient of wine but yeast is not, since yeast never remains in the finished wine. Similarly, fining agents that may be added to a wine (but do not remain in the wine) are not ingredients.
<b>Inoculation</b>	The addition of living microbes, such as yeast and bacteria, to must or wine.
<b>Internode</b>	The section of a grape vine stem between two successive nodes or joints on the vine shoot or cane.
<b>Invertase</b>	An enzyme that hydrolyzes sucrose into its two component fermentable sugars, glucose and fructose.
<b>Ion-exchange column</b>	A column packed with resin that can exchange its ions (i.e., Na <sup>+</sup> ) for a similarly charged ion (i.e., K <sup>+</sup> ) or a solution passed through the column. By removing potassium, wines can be cold stabilized.
<b>Isomers</b>	Two or more compounds possessing the same molecular formula, but differing in at least one chemical or physical property.

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<b>Isotopes</b>	Variants of a chemical element that differs in mass due to the number of neutrons present in the nucleus of the atom.
<b>Jeroboam</b>	Oversize wine bottle; however, the exact size is not standardized. It may be equivalent to 4, 5 or 6 standard (750 ml) bottles, depending upon the wine producer. In Champagne, France and in California, it is often 3 liters in size; in Bordeaux, 3.75 liters; in England, as much as 4.5 liters.
<b>Jug Wines</b>	Common name given to wines sold at modest prices in 1.5-liter size or larger containers.
<b>Juice run-off</b>	Same as <i>Saignée</i> .
<b>Kabinett</b>	German classification for quality wines ranking just below <i>spätlese</i> . <i>Kabinett</i> wines are relatively low in price, but sugar is never used in their production.
<b>Keg</b>	Small barrel for wine aging or storage -- usually 12 gallons in size.
<b>Killer factor</b>	One of a series of proteins, produced by carrier strains of yeast that can kill related strains or occasionally unrelated yeasts, filamentous fungi, or bacteria.
<b>Labrusca</b>	A principal species of native North American grapes. Concord is the purest example currently grown on a large scale in the eastern U.S. Concord is also grown commercially in the Midwest and, oddly, in Washington State. There is none in California except a few individual vines growing in a few back yards.
<b>Laccase</b>	Enzyme which can occur in grapes (especially under wet conditions). Causes rapid and damaging oxidation of juice and wine.
<b>Lactic acid</b>	A natural organic acid that occurs in many foods, including milk. In wine, it exists only in trace amounts unless the wine has undergone a malo-lactic secondary fermentation.
<b>Lactic acid bacteria</b>	A group of strictly fermentative bacteria that can induce malolactic fermentation or various forms of wine spoilage.
<b>Late Harvest</b>	Name given to dessert or full-bodied table wines produced from overripe or botrytized grapes, i.e., they're picked late.
<b>Leaf axil</b>	The acute angle between a vine shoot and a leaf stem or petiole extending from the shoot. Buds develop in these axils just above each leaf petiole.
<b>Lees</b>	It is the sediment that settles to the bottom of a wine in a tank during processing. It includes material such as dead and dying yeast and bacteria, grape cell remains, seeds, tartrate salts, precipitated tannins and fining agents. If primarily yeast, as from a fermentation, it is called "yeast lees;" if sediment from fining, it is called "fining lees".

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<b>Legs</b>	Wine and spirits are basically mixtures of water and ethanol. As individual compounds, they have two different physical distinctions. Alcohol has a lower boiling point than water and hence, evaporates faster than water. Water has a higher surface tension than ethanol. The attractive forces between molecules in a liquid are called surface tension. These forces hold the liquid together. The same type a force acts between molecules of a liquid and those of a solid surface. This force is called 'interfacial tension'. If the interfacial tension between a wine and a glass is a bit greater than the wine surface tension, then this causes wine (or spirits) to climb the inside walls of a glass. A point is reached at which the weight of the wine clinging to the glass just balances the force trying to lift more. Once the inside of the glass is covered with a thin film, the wine film loses some of its ethanol by evaporation. With the concentration of water increasing, the film surface tension increases, as does the index of refraction. In the areas where alcohol evaporates, the watery-wine left behind assumes a drop-like form. The drops become heavier and the force of gravity becomes controlling and the drops slides down the glass wall to the wine in the bowl. These legs can be seen because the change in the refractive index makes the boundary between the watery legs and the more alcoholic film visible. The channels of falling wine appear as "legs".
<b><i>Leuconostoc oenos</i></b>	The primary bacterium inducing beneficial forms of malolactic fermentation.
<b>Light-struck</b>	A light-induced off-odor associated with the production of methanethiol and dimethyl disulfide. Can smell a bit skunky. Happens to beer, too.
<b>Lignin</b>	A large polymer of hydroxycinnamyl alcohols that characterizes woody cell walls; it is the source of important aromatic phenolics extracted during wine maturation in oak cooperage.
<b>Limousin</b>	(limo-zan). Limousin is one of the major oak forest regions of central France. Limousin is also the name of the oak wood from that forest, or even oak wood that is shipped from the town of Limoges in central France. Limousin is among the favorite types of oak for French barrels in the new world. Its grain is less tight and more open than others, an advantage for Cognac production. The open grain allows oak flavor to become extracted out of the wood quickly, which may be a disadvantage for the more delicate Chardonnays.
<b><i>Liqueur d'expédition</i></b>	Blend of wine, sugar, and sometimes brandy, added to champagne after disgorgement to balance sweetness.
<b><i>Liqueur de triage</i></b>	Solution of wine, yeast and sugar added to champagne to induce second fermentation.
<b>Liter</b>	Standard volume of measure in the metric system .1 U.S. gallon = 3.785 liters.

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<b>Maceration</b>	The act of soaking grape solids in their juice for certain time periods prior to fermentation of the juice. Generally the grapes are chilled to prevent fermentation from beginning. This is also known as skin contact.
<b><i>Macération carbonique</i></b>	see Carbonic Maceration.
<b>Maderized</b>	Oxidation of table wines due to improper (or too long) storage. Maderized wines, both white and red, are recognized by their brown color, lack of fruitiness and oxidized taste. Maderization gives Madeira wines part of their desirable character; but the same character is undesirable in normal table wines.
<b>Magnum</b>	Oversize bottle, twice the size of a standard 750 ml. wine bottle.
<b>Maillard reaction</b>	The product of nonenzymatic reactions between sugars and amine compounds (amino acids and proteins), which produce polymeric brown pigments and caramel-like bouquets.
<b>Malic acid</b>	A natural organic acid that occurs in ripe grapes in relatively high concentrations. It is the second most abundant organic acid in most vinifera varieties.
<b>Malolactic fermentation (MLF)</b>	A bacterial fermentation that sometimes occurs in new wines after the primary yeast fermentation. Malolactic, or secondary fermentation changes natural malic acid into lactic acid and CO <sub>2</sub> . From the wine taster's point of view, malic acid, which has a sharp flavor, is removed. Carbon dioxide is given off, and the much less acidic and softer tasting lactic acid appears. This smoothes the flavor of the wine. Usually a wine that has undergone malolactic fermentation is less acidic and can take on buttery and creamy overtones, as lactic acid is the type of acid found in milk.
<b>Manhole or man door</b>	Large opening in the sidewall of a wine tank through which spent pomace or lees is removed after the wine is racked (drained) off. Cellar workers can enter through the manhole for tank cleaning.
<b><i>Marc</i></b>	French word for residue stalks, skins and seeds left after pressing. In the U.S. it's called pomace. Also a term for spirits made from pomace.
<b>Maturation</b>	The period between the end of fermentation and bottling, during which the wine is clarified, stabilized and aged in various containers.
<b>Mercaptan</b>	A short-chained hydrocarbon containing a thiol group (-SH); it is highly volatile, possessing strong, putrid odors. Derives from hydrogen sulfide and manifests itself in a range of unpleasant odors (rotten egg, burnt rubber, gamey meat, garlic, stale cabbage and also some really bad smelling things).
<b>Meristem</b>	Region of active growth in a grapevine, made up of

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	meristematic cells that divide to form new cells during growth.
<b>Meristematic tissue</b>	The actively growing tissue of a grape vine. Meristem cells are located in the cambium, shoot tips, buds, root tips and flower. Meristematic tissue is composed of thin-walled actively growing cells that form new cells by dividing.
<b>Metabisulfite</b>	A salt, normally, with potassium. Called KMS. An easy way to add sulfite to must, juice and wine.
<b>Metabolite</b>	A by-product of a biochemical pathway, e.g., ethanol via fermentation.
<b>Metallic</b>	Aluminum-like taste.
<b><i>Méthode Champenoise</i></b>	Literally, "made by the Champagne method" the classic, time-consuming way to produce Champagne and many other sparkling wines. This is the traditional bottle-fermented method for producing sparkling wines, including fermenting, aging, hand riddling and disgorging -- all in the same bottle that will eventually reach the consumer.
<b>Microbe</b>	A microscopic organism that in wine may be a bacterium, yeast, or filamentous mold.
<b>Microbiologist</b>	Every winery has someone responsible for all microbiological concerns. They help create yeast and bacterial inocula, monitor sterility in wine containers and oversee bottling.
<b>Microclimate</b>	The localized climate in a specific, small area as opposed to the overall climate of the larger, surrounding region. A microclimate can be very small, as to encompass a single vine, or cover a whole vineyard of several acres or more. Microclimates can be caused by slope of the land, soil type and color, fog, exposure, wind and many other factors.
<b>Mildew</b>	Grapevine disease. Can be devastating but is usually controlled by dusting the vines with sulfur or spraying with organic fungicides. The two major types of mildew are Powdery mildew, which occurs in (low humidity) California and Downey mildew, which occurs in (higher humidity) Europe and other wine regions of the world.
<b>Mineral ions</b>	Electrically charged forms of minerals, usually occurring in solution in the soil moisture and available for take-up by roots. Some examples used by grape vines are: potassium, calcium, phosphate, boron, nitrate, sulfate, iron, manganese and magnesium.
<b>MOG</b>	An acronym for "materials other than grapes". These are the things delivered to a winery from a vineyard that are mixed with the grapes; leaves, canes, picking knives, etc.
<b>Mouth-feel</b>	The tactile sensation (i.e., astringency, prickling, body, heat, etc.)

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<b>Must</b>	This results from crushing fresh grapes (before fermentation). Includes pulp, skins, seeds, juice and bits of stem. <i>Moût</i> in French.
<b>Muté</b>	Unfermented juice. Used for sweetening wines prior to bottling. Kept in storage with high levels of FSO <sub>2</sub> , refrigeration of sterile filtration.
<b>Natural</b>	Term used on the label to designate a champagne or sparkling wine that is absolutely dry.
<b>Nevers</b>	One of the types of French oak used for wine barrels. Similar to Alliers in that both come from central France and both woods are tight-grained as opposed to Limousin, which has a looser, more open grain.
<b>Noble Rot</b>	Common name for <i>Botrytis cinerea</i> , the famous fungus of more than a few fabulous dessert wines.
<b>Nodes</b>	Slight enlargements occurring at more or less regular intervals along the length of vine shoots and canes. One leaf develops at each of these nodes and a new bud forms in the axil at the node also.
<b>Nonflavonoid</b>	A phenolic compound or its derivative, based on a phenol ring possessing a 1- or 3-carbon side chain.
<b>Norisoprenoid</b>	An aromatic breakdown product of carotenoids, which may contribute significantly to the aged bouquet of some white wines.
<b>Nose</b>	The odor of a wine, including aroma and bouquet.
<b>Nouveau</b>	Term used to describe a Beaujolais-like wine: Young, fresh, fruity and neither wood-aged nor complex. Nouveau wines are not designed for long aging but are made for prompt consumption.
<b>Oak</b>	A type of hardwood commonly used for building wine barrels. American oak has a distinctive, bourbon-like flavor but French oak flavor is much more subtle. Both types of oak barrels contribute considerable tannin and vanillin (vanilla) flavors to wines during aging.
<b>Oaky</b>	Excessive oak flavor in a wine.
<b>Oenology</b>	(Pronounced "ee-nol-o-gee") Oenology, also spelled enology, comes from the Greek word <i>oinos</i> , which means 'wine'. It means the study of wine and winemaking. This is thought of differently than viticulture, which is the study of grapes and grape growing. Someone who studies winemaking is called an "oenologist."
<b>Off-odor</b>	A odor perceived to be undesirable.
<b>Off-taste</b>	An imbalance in taste sensations perceived to be undesirable.

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**Oidium**

French name for the fungal vine disease "Downey mildew."

**Open-top tanks**

Wine tanks without permanent covers, used only for red wine fermentation. This is the traditional design for fermenter, but modern wineries normally use only the closed-top design. Open top tanks are more difficult to keep clean, allow loss of wine flavor during fermentation and require some type of surrounding building or roof in case of rain. Some open-top tanks have replaceable lids.

**Ordinaire**

From "*vin ordinaire*," the term means any common wine of everyday quality.

**Osmosis**

The natural movement of fluids through a membrane or porous partition such as a cell wall. Fluid tends to move through the membrane towards a solution of higher concentration so as to equalize the concentrations on both sides of the membrane. That's important to a grower watching his vines grow or to a winemaker who wants to process a wine to remove excess volatile acidity, alcohol or other component by "reverse osmosis."

**Over cropped**

A vine that carries more crop than it can reasonably ripen. Vines that aren't pruned drastically enough tend to set too much crop. Wine produced from fruit of an over cropped vine is always poorer in quality than if the crop were normal size. An over cropped vine can be corrected, if it's done in time, by simply thinning the crop in late June or early July. The grower sends in a crew to cut off from 10 to 40% of the over cropped fruit while it is small and green. The remaining fruit will develop and ripen correctly.

**Over cropping**

The act of allowing vines to set more fruit than they can reasonably hope to ripen fully. This mistake is usually caused by pruning too lightly in the dormant season. Wines made from over cropped fruit are often wimpy, watery and without much flavor, body or color.

**Overmature**

Juice concentration and change in flavor associated with fruit having been left on the vine (or in storage) for several weeks or months after reaching maturity.

**Oxidases**

Naturally occurring enzymes causing oxidative changes including browning.

**Oxidation**

The chemical reactions involved in combining oxygen with wine to produce "oxidized" changes in the flavors and color of the wine. In table wines, oxidation is almost always undesirable, and irreversible. Once ruined, the wine stays ruined. Oxidation can be defined as any adverse change in wine flavor, stability and/or color caused by excessive exposure to air.

**Oxidized**

Flavor term to describe a wine that has suffered excessive oxidation through exposure to oxygen. During oxidation, wines lose their original fruitiness and take on a darker color,

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	eventually becoming quite brown and taking on a Sherry like, "vegetable soup" type of flavor.
<b>Parts per million (ppm)</b>	A comparative unit of small measure which is exactly as it sounds -- pounds of something per million pounds of something else, grams per million grams, etc. One red grain of sand among a million white grains is one part per million.
<b>Pasteur</b>	Louis Pasteur, the "father of modern winemaking and pasteurized milk," did his famous research at the town of Arbois in France's Jura region. He correctly identified yeasts as the causative organisms for fermentation and developed a heat process (Pasteurization) for stabilizing wine, milk and other liquid foods from spoilage. Pasteur wrote, "Wine is the most healthful and hygienic of beverages."
<b>Pectins</b>	A series of gel-like galacturonic acid polymers important in holding plant cells together; frequently they release methanol on degradation under the effect of certain pectinases.
<b>Pétillant</b>	Term describing a wine which is noticeably sparkling or bubbly with CO <sub>2</sub> -- but which is less carbonated than Champagne/Sparkling Wine.
<b>Petiole</b>	The stem that attaches a leaf to its main branch or shoot. Petioles are well designed for conducting water, sugars and mineral ions between the leaf and the rest of the vine.
<b>pH</b>	A mathematical term for describing and identifying the concentration of hydrogen ions (H <sup>+</sup> ) in a solution (such as wine). Since hydrogen ions are the most accurate definition of acidity, pH is an accurate measure of acidity in juice and wine. Winemakers who understand the relationship between pH and taste would rather know the pH of a wine than its titratable acidity (T.A.). Titratable acidity is another measure of acidity but T.A. is less apparent to the taste than is pH.
<b>Phenolics</b>	A term to include all of the various types of compounds having the general chemistry of phenols with a benzene ring and at least one hydroxyl (OH-) group. The different types of phenols are grouped with closely related substances like anthocyanins, flavones and leucoanthocyanins which accumulate in grape seeds and skins.
<b>Phloem</b>	Living plant tissue located just beneath the bark and outside of the cambium layer. Phloem cells conduct sugars and other organic materials downward from the leaves towards the trunk and roots. The xylem tissue, by contrast, is just inside the cambium layer and it conducts water and minerals from the roots upwards towards the leaves. It's like a two-lane highway where the cambium is the double yellow line; outside the cambium layer the phloem conducts downward but inside the cambium the xylem conducts upwards. And, just as with highways, there are pores between the two layers, which allow traffic going in one direction to cross through the cambium and go the other way.

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## Photosynthesis

The biochemistry that manufactures carbohydrates (sugars) in green tissue of living plants from CO<sub>2</sub> and water. The CO<sub>2</sub> enters leaves directly from air and the water comes up from the roots. The reaction uses sunlight as its energy source and it is catalyzed by chlorophyll.

## Phylloxera

Microscopic aphid that lives on vine roots by sucking their juice. Unfortunately this isn't very good for most roots. The aphid kills European wine varieties but native American vine roots are resistant.

## Pigeage

French term for treading grapes and mixing the skins with the fermenting must. Traditionally done with bare feet.

## Pipe

A large barrel or cask used for storing, transporting or aging wine, especially dessert wine. Pipes vary in size between about 110 and 140 U.S. gallons.

## Pneumatic presses

A device that uses the application of air pressure in an elongated rubber tube to gently release juice or wine from crushed grapes.

## Polish filtration

Final prebottling filtration to assure a stable brilliant wine.

## Polymerization

Aggregation of anthocyanins and tannins into larger particles, leading to color changes of red wines as they age and ultimately to precipitation of sediment in the bottles.

## Polyphenols

Chemical class of compounds which occur naturally in wine, giving it an astringent, bitter or mouth-drying taste sensation. Tannins and grape skin pigments are two prominent classes of polyphenols.

## Polyphenol oxidase

Enzymes that catalyze the oxidation of phenolic compounds; grape enzymes oxidize monophenols whereas fungal enzymes oxidize mon- and di-phenols.

**Polyvinylpyrrolidone (PVPP)** A high molecular weight fining agent made of crosslinked monomer of polyvinylpyrrolidone. It complexes with phenolic and polyphenolic components in wine by adsorption and attracts low molecular weight catechins. It removes bitter compounds and browning precursors in both red and white wines.

## Pomace

The solid residue (primarily skins, seeds and stems) left over from draining juice from white must, or draining new wine from a red fermentation tank.

## Powdery mildew

A devastating fungal disease of grape vines that, unlike most fungal diseases, thrives in dry climates. Also called oidium, it occurs in most of the wine regions of the world. This is the most troublesome fungus disease of grapes in California by far. It can be controlled by timely application of sulfur dust directly onto the vine leaves and immature fruit.

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<b>Precipitation</b>	The sudden formation of solids within a solution, as happens in the fining of wines. The solids normally settle to the bottom as sludge within a few hours or days and can be easily removed by filtration, centrifuging or, many times, by simple racking.
<b>Press</b>	Equipment used to separate juice or wine from skins, pulp and seeds.
<b>Press cake</b>	The “drier” solids remaining in the press after pressing out all the juice or wine. This is now pomace.
<b>Press juice or wine</b>	The juice or wine obtained not by draining (the free run) but by pressing. It is usually far more tannic (often bitter) than drained or lightly pressed juice or wine.
<b>Prise de mousse</b>	<i>Méthode Champenoise</i> term for the second fermentation when the <i>Liqueur de triage</i> is converted to alcohol and releases CO <sub>2</sub> in the bottle.
<b>Procyanidins</b>	These are grape tannins. Polymers of flavon-3-ols (catechins and epicatechins) and occasionally gallic acid; they induce bitter and astringent sensations and promote color stability.
<b>Produced</b>	Legal term used by U.S. governing authority, TTB. A wine that is produced must have been fermented by the bottling winery. If the label states “Made,” “vinted,” “cellared,” and “perfected”, the wines bottled were fermented by someone beside the bottler.
<b>Proof</b>	Scale for measuring and expressing the alcohol content of high alcohol liquids. Proof is never used for wine. The proof of a liquor is twice its alcohol content, i.e., 80 proof = 40% alcohol. Since wine is always much lower in alcohol than the range commonly used for proof, the term has no use in wine production and is not used on wine labels.
<b>Protective colloids</b>	The dispersed polysaccharides or dissolved proteins that limit the crystallization, nucleation and precipitation of other compounds in wine.
<b>Protective winemaking</b>	New World approach designed to exclude effects of oxidation on both juice and wine. Many different practices employed.
<b>Pruning</b>	The act of cutting off various parts of grape vines, usually in winter when the vines are dormant. Pruning develops the shapes of vines when they are young and controls the growth, fruit quantity (and therefore, quality) of producing vines.
<b>Pulp</b>	The central major fleshy part of the grape interior.
<b>Pumping over</b>	The act of pumping wine out from a bottom valve of a fermenting tank up onto the top of the fermenting mass in the same tank to keep the floating “cap” of skins wet. This is necessary during fermentation of red wine in order to achieve complete extraction of color and flavor from the skins. In

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	France it is <i>remontage</i> .
<b>Pumps</b>	The primary equipment used for transferring wine from one location to another. An array of pumps types exist.
<b>Puncheon</b>	A 500-liter barrel. Common in Cognac.
<b>Punching down</b>	The act of pushing the cap down into the fermenting liquid to wet it and facilitate color and flavor extraction. This is the traditional method, but it can only be used for small tanks. Larger tanks are “pumped over,” which means pulling fermenting liquid from the bottom valve of a fermenting tank and spraying it over the top surface of the cap in the same tank. This wets the cap with new wine and helps to extract color and flavor from the skins in the cap.
<b>Punt</b>	The concave indentation in the bottom of certain wine bottles, especially those containing sparkling wine. Also called push up or PU. Bottles with no punt are flat bottom, or FB.
<b>Pupitre</b>	(pup-ée -ter) French name for the hinged, wooden “A-Frame” rack used for riddling Champagne bottles prior to disgorging. (Riddling settles the yeast sediment into the neck so that it can be easily removed by the disgorging step.)
<b>Pyrazines</b>	A group of aromatic nitrogen-containing cyclic compounds; they are the source of strong “green” aromas in the grapes indigenous to Bordeaux.
<b>Quality Control (QC)</b>	The winemaking activity responsible for ensuring bottled wines will be received in a sound condition by the consumer. The person doing QC, works closely with the winemaker. They are concerned about the wines cold and heat stability and the soundness of the entire production operation of the winery.
<b>Quinta</b>	“Farm” in Portuguese. The name on a Portuguese wine label identifies the source of grapes used for the wine.
<b>Rachis</b>	The skeleton of branched stems that gives a grape bunch or cluster its shape. The rachis isn’t obvious when covered with grapes, but very obvious after the individual grapes have been removed by shaking or picking.
<b>Racking</b>	Decanting clear juice or wine from above the sediment (lees) in a container. This is the easiest method for getting rid of solids that have settled to the bottom in a tank or barrel. Wine tanks commonly have a built-in “racking valve” placed 20 inches (~half a meter) above the bottom valve for use in racking wines during production.
<b>Raisined</b>	An aroma or flavor in wine made from overripe, “raisiny”, grapes.
<b>Rancio</b>	Taste of old, often fortified, wine. Maderized on purpose.
<b>Random Amplified Polymorphic</b>	A technique of DNA fingerprinting using labeled segments of

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	DNA isolated and copied
DNA (RAPD)	with DNA polymerase.
Redox balance	The relative proportion of oxidized and reduced forms of electron carriers NAD and NADP involved in cellular oxidation and reduction reactions.
Redox potential	The relative potential of compounds to be oxidized or reduced.
Reduced	The technical term describing a state which is the chemical opposite of "oxidized." It is sometimes instructive to think of the reduced state as "negative oxidation." In wine, the reduced state is usually recognized by the obvious smell of rotten eggs (hydrogen sulfide, or H <sub>2</sub> S) which nearly always accompanies the reduced state. A compound gains an electron (or hydrogen atom) and becomes reduced.
Reductive environment	One in which there are decreasing amounts of oxygen available for chemical changes of maturation (in a bottle) or where reductive (negative) reactions can occur (new wine in stainless steel tanks).
Refermentation	Fermentation initiated by addition of yeast and nutrients (probably sugar) to a wine which has stopped fermentation before all the fermentable sugar has been depleted. A "stuck" fermentation.
Refractometer	A hand-held device used to measure the sugar content of grapes; the measurement is based on the proportional diffraction of light by sugar in grape juice.
Remuage	Ridding champagne of sediment in the bottle after second fermentation. Turning and gradually tilting bottles, from horizontal to perpendicular, coaxes the sediment down the neck for removal.
Residual sugar	Term commonly used in wine analysis referring to the content of unfermented sugar in a wine already bottled. In a dry wine, this primarily involves the nonfermentable sugars arabinose and thamnose.
Respiration	The biochemical process whereby plants use oxygen to burn fuel (usually sugar) to create energy for their own growth, development and fruit production. Animals use these same reactions except that animals take in oxygen through lungs, whereas plants absorb it through leaf pores and by diffusion of dissolved oxygen across membranes in leaves, roots, etc.
Resveratrol	A stilbene compound produced by grapes in response to environmental stress, notably to attack by pathogenic fungi; an important antioxidant involved in some of the beneficial health consequences of moderate wine consumption.
Reverse osmosis	Osmosis is the process of two substances naturally reaching the same levels of composition through a membrane (a filter).

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	<p>To separate out components, is to reverse the process, and hence the name 'Reverse Osmosis'. If one is trying to separate components out of a substance through a membrane, it needs substantial pressure, rather than a natural process. Alcohol is, therefore, in this process, filtered out. Some water does leave as well, but the grape wine concentrate remains, which is the vast majority, but a little of the wine concentrate and water is added back into make up the bulk and balance flavors.</p>
<b>Ropiness</b>	<p>The presence of long visible chains of spoilage lactic bacteria in wine; the large amount of gelatinous polysaccharides that are produced noticeably increases the wine's viscosity.</p>
<b>Rosé</b>	<p>French word for pink wine, the word is in common use all over the world.</p>
<b>Rotary drum vacuum filter</b>	<p>Equipment which recovers grapes juice from the creamy mud gathered after cold settling; also used for filtration of wines from lees and of viscous sweet wines.</p>
<b><i>Saccharomyces cerevisiae</i></b>	<p>The primary wine yeast; if it does not initiate fermentation, it typically soon dominates and completes alcoholic fermentation.</p>
<b>Sack</b>	<p>Shakespearean era name for Sherry wine.</p>
<b><i>Saignée</i></b>	<p>(sen-yay) This winemaking process involved bleeding off a portion of red juice after only a short period of contact of the juice with the grape skins. Because the color of red wine is derived from pigments in the skins, the juice is only pink not red. This process is how rosé wines are made, the only exception being Champagne where rosé may also be made by blending red and white wines. The process may also be used to improve the quality of red wines, as it increases the ratio of skins to juice in the vat, so a more deeply colored wine may be obtained.</p>
<b>Sapwood</b>	<p>The outer portion of woody (xylem) tissue, located just inside the cambium and just outside the heartwood. Sapwood forms the primary highway for transmission of water and minerals from the roots up through all parts of the vine towards the leaves.</p>
<b><i>Sauternes</i></b>	<p>A region in south western France which produces fine dessert wines of the same name from the Semillon and Sauvignon varieties.</p>
<b><i>Schloss</i></b>	<p>A German word for castle; on a wine label it is equivalent to the French word "Chateau."</p>
<b>Scuppernong</b>	<p>One of the two major classes of Native American grapes. Scuppernong varieties produce their grapes on individual stems from the branches rather than in "Bunches" or "clusters" of grapes that we see in both European vinifera and American labrusca grape types.</p>

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<b>Seasoning</b>	Ageing of oak in air after it has been cut before it is made into barrels.
<b>Sec</b>	French term meaning "dry," or lacking sugar. However, on French Champagne labels it means that the wine is sweet.
<b>Secondary fermentation</b>	Any fermentation that happens after the primary (yeast) fermentation has been completed. Malo-lactic is a secondary fermentation that occurs in most red, and some white, still wines. Another secondary is the yeast fermentation that is used to change still wine into sparkling wine.
<b>Sekt</b>	German word for sparkling wine.
<b>Sensory Evaluation</b>	The scientific evaluation of the quality and characteristics of a food or beverage.
<b>Set</b>	The fixing of tiny, newly pollinated grape berries to the cluster stems.
<b>Shatter</b>	The drying up of a large percentage of unsuccessfully pollinated pistils leaving a nearly bare stem skeleton (with few berries attached) where a fully populated grape cluster should be. If you were expecting a crop of, say, 5 tons per acre but suffer considerable shatter in June, you might eventually get only 2 tons per acre, even with good weather for the rest of the season.
<b>Shoot</b>	The elongating, green, growing vine stem that holds leaves, tendrils, flower or fruit clusters and developing buds.
<b>Shot berries</b>	A few small, seedless grapes found in an otherwise normal bunch of wine grapes. The cause is improper fertilization during the blooming period.
<b>Skin contact</b>	see Maceration.
<b>Sparkling wine</b>	A wine that has CO <sub>2</sub> gas in solution. The CO <sub>2</sub> can be present as a result of fermentation or injection.
<b>SO<sub>2</sub></b>	The chemical shorthand symbol for sulfur dioxide, the primary antioxidant/preservative in table wines.
<b>Soft</b>	Legal term for a wine that is low in alcohol. Also a term to describe the taste of a red wine that is low in astringency.
<b>Solera</b>	Spanish system for aging and slow blending of Sherries in barrels. It is also the preferred method of blending used to make Tawny Ports and many dessert wines. In this method, the first sherry is "laid down" in a cask. The next year, the next vintage is put above it. Over time, as some sherry is removed from the bottom cask, it is "replenished" with liquid from the cask over it, which is replenished from the cask over it, and so on. The "series" of casks is called a <i>criadera</i> , and the cascade method is called "running the scales." Only 33% of the <i>solera</i> is removed per year. In this manner, the sherry maintains a

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	consistent taste. Often, wine produced by this method can contain wine from up to 30 vintages. <i>Solera</i> wines are quite consistent year after year because of uniform blending of many different vintages together.
<b>Sour</b>	The taste sensation of acid.
<b><i>Spätlese</i></b>	German word meaning “late harvest.” These wines are usually sweet, high in quality and more expensive than ordinary table wines.
<b>Spicy (or Spicy)</b>	Tasting term to describe a wine that tastes as if it had spices added during production. Gewürztraminer is the wine variety that is most often referred to as spicy. Also, the smell or taste sensation reminiscent of spices. The Gewürztraminer varietal flavor is naturally spicy, especially when grown in cool climates.
<b>Spinning cone</b>	Wine is fed into the top of the spinning cone column and flows down over a series of alternating stationary and rotary metal cones. Centrifugal force transforms the wine into a thin liquid film, which is contacted by ascending nitrogen gas fed into the bottom of the cone. The nitrogen acts as a carrier to extract the volatilized aroma and flavor compounds from the wine. These essences are then condensed, separated and safeguarded while the liquid is run through the cone again, at slightly higher temperatures, to remove the alcohol. Then they are reintroduced to the dealcoholized wine.
<b>Spontaneous fermentation</b>	Alcoholic fermentation induced by the yeast inocula that occurs on the grapes or that is in residence on the cellar walls or equipment.
<b><i>Spumante</i></b>	The Italian word for sparkling wine. Most famous in Asti. Equivalent to <i>sekt</i> in German.
<b>Spur</b>	A shortened stub of cane, usually formed by pruning the cane to a length of only two to four nodes (buds). Spurs are obvious in the spring, after pruning but before new growth obscures the pruners' handiwork.
<b>Stabilization</b>	In QC and microbiological terms, ensuring the wine is cold and heat stable and microbially sound.
<b>Stalks</b>	The word (in every English speaking country but America) for “stems.” An American “stemmy” tasting wine is “stalky” tasting in England.
<b>Stave</b>	A shaped piece of wood that forms part of a barrel or other type of cooperage.
<b>Stemmer crusher</b>	Removes the stems before crushing the berries.
<b>Stems</b>	The pile of skeletal remains of grape bunches or clusters (rachis parts) left over after the grapes have been removed at the crusher. The crusher spits these out in a pile as waste

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	<p>material when crushing grapes for fermentation. Often during grape crushing the rachis gets broken, allowing bits of stem to remain in the must during fermentation. These bits of stem make up part of the cap in a red fermenter and part of the pomace after the new wine is drained from the tank. Generally, leaving the stems in contact with the juice during fermentation is undesirable because stems can supply "bitter" or "green" tasting tannin to the liquid. Some Pinot noir id Burgundy is fermented with stems. Some winemaker put their uncrushed white grapes directly in a press, stems and all.</p>
<b>Sterile filtration</b>	<p>Filtration through ultrafine pads or membranes which removes unwanted microbes.</p>
<b>Still wine</b>	<p>Is neither sparkling nor a dessert wine, i.e., does not contain significant carbon dioxide in solution nor high alcohol.</p>
<b>Stomata</b>	<p>Tiny openings on the undersides of grape leaves through which pass gases and water. The important gas that passes through stomata is carbon dioxide, which is on its way in -- to get captured by the chlorophyll and be turned into sugar.</p>
<b>Stuck fermentation</b>	<p>A yeast fermentation that stops prematurely and refuses to start up again even though live yeast and fermentable sugar still remain in the liquid. Stuck fermentations are bad news, because, when the yeast stops, bacteria usually take over, using up the rest of the sugar and turning your precious wine into vinegar.</p>
<b>Sugaring</b>	<p>Called "chaptalization" in France. Sugaring is the addition of common sugar to fermenting grape juice or must (from under ripe fruit) for the purpose of raising the eventual alcohol content in the wine. Illegal in California, sugaring is usually needed only in very cool climates (or off vintages) in which the fruit fails to achieve full ripeness naturally.</p>
<b>Sulfite</b>	<p>The dissolved form of sulfur dioxide. Plural: sulfites, as in "this wine contains sulfites."</p> <p>Sulfur dioxide has been used in the wine making process for thousands of years. It has three important functions in wine making. (1) It has antiseptic qualities that kill the wild yeasts and bacteria that are present on the fruit. (2) It has anti-oxidant qualities that help protect wine from oxidation. (3) It destroys the enzyme system that causes browning in the juice.</p>
<b>Sulfur bung</b>	<p>A wooden bung with a hook at the bottom. To the hook is attached part of a sulfur wick. The stick is lit and the bung placed tightly in an empty washed barrel. The sulfur burns and sanitizes the barrel interior. Chalked on the barrel head, you might see chalked "W&amp;S" with a date, to signify when the barrel was last washed and sulfured.</p>
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>	<p>A pungent gas used in wine to inhibit wild yeast growth, to protect wine from air oxidation and to inhibit browning in juice and wine. It's used for wine in parts per million amounts</p>

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	<p>only; at those levels the smell and taste are not generally noticed. It is safe for human consumption except for a miniscule minority of brittle asthmatic persons, who must avoid it like the plague. For those few unfortunates, SO<sub>2</sub> can be life threatening, even in ppm amounts. This is the reason wine labels always say, "contains sulfites."</p>
<b>Sulfur stick</b>	<p>A 1" x 4" x 1/8" stick of sulfur. They are burned into cooperage to sanitize. Usually a quarter of a stick is used for barrels.</p>
<b>Surface sterilant</b>	<p>An agent that kills microbes and inactivates viruses on the surface of objects.</p>
<b>Surfactant</b>	<p>A compound that reduces the surface tension and eases the spread of fluids over a surface.</p>
<b>Sur lie</b>	<p>French term meaning "on the lees". After completion of fermentation, wine is left in contact with yeast lees. This can occur in a barrel (Muscadet and Burgundy) or bottle (Champagne). Autolyzed yeast cells add amino acids and other compounds to the wine. Stirring aids in the addition. Adequate aging (9 months) of the wine <i>sur lie</i> is needed to develop roundness in the body, increase complexity and retain the wine freshness.</p>
<b>Suspended solids</b>	<p>Microscopic particulate matter that is held temporarily in suspension following crushing of the grapes.</p>
<b>Sweet pomace</b>	<p>Solid grape residue that is left over after the juice is drained off, but prior to fermentation. Primarily composed of skins, pulp and seeds.</p>
<b>Sweet reserve</b>	<p>Partly fermented juice. Later used for sweetening other wines prior to bottling. Kept in storage with high levels of FSO<sub>2</sub>, refrigeration of sterile filtration.</p>
<b>Table Wine</b>	<p>Legally defined category of wine that includes all wines with lower than 14% alcohol content. Colloquially, "wine meant to be enjoyed at the dinner table with meals."</p>
<b>Tank</b>	<p>A container for storing wine. The fine line between a tank, a cask and an oval exists. Barrels and puncheons are too small to be called tanks.</p>
<b>Tannin</b>	<p>Any of a class of natural polyphenolic materials that can react with proteins, as, for example in the tanning of animal hides – "tanning" them into leather. Tannin is a desirable component of most red wines, adding considerable "body" and a pleasant, mouth-drying taste. Most types of tannin have an astringent (tactile sensation) and sometimes a bitter taste. Tannin in wine comes from grape skins, stems, or seeds (if seeds are crushed or broken open by mistake or sloppy winemaking) and from wood contact during barrel aging. Seed tannin is the least desirable in wine because this type of tannin is usually quite bitter and most crushers are designed to avoid breaking the grape skins. Tannin is primarily responsible for the dusty</p>

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	<p>or dry and sometimes bitter taste in red wines like Cabernet. Tannin is the component that allows red wine to age, acting as a natural preservative, helping the development and balance of the wine. Tannin is a potent antioxidants and promotes color stability. It is considered a fault when present in excess.</p>
<b>Tape</b>	<p>During wine movements, to determine how much wine is in a partial tank, a measuring tape is suspended from the top of the tank to the tank bottom to find the number of inches of wine. Every tank has a calibration chart (generally in the cellar office) used to convert inches of wine to gallons.</p>
<b>Tart</b>	<p>Acidic (used as a descriptor in wine tasting).</p>
<b>Tartaric acid</b>	<p>The most prominent natural acid of grapes, juice and wine, tartaric acid is not usually found in other fruits or vegetables. Tartaric acid is recovered from "cream of tartar," which is scraped from the insides of wine tanks and sold as a by-product of winemaking. Cream of tartar is used in cooking as well as in paints, cleaners and for other chemical formulations.</p>
<b>Tartrate</b>	<p>Tartrate crystals are clear, glassy crystals that form in the bottle or on the cork. They are harmless and do not effect the flavor of the wine.</p>
<b>Taste buds</b>	<p>Specialized regions on the tongue that posses receptor cells for taste sensation.</p>
<b>TCA Cycle</b>	<p>The metabolic cycle that generates most of the reduced NAD in respiration; also an important source of components for conversion to amino acids (also called the Krebs or citric acid cycle).</p>
<b>Tendrils</b>	<p>String like, coiling growth from nodes of grape shoots that support vines by curling around objects and hanging on for dear life. Tendrils are thought of as sterile or undeveloped grape clusters, since the two have a common origin.</p>
<b>Terpenes</b>	<p>Polymers of isoprene structure important in generating many floral and fruit fragrances.</p>
<b>Terroir</b>	<p>Earth or soil, used in the special sense of "place," which includes localized climate, soil type, drainage, wind direction, humidity and all the other attributes which combine to make one location different from another. This word is often mis-translated to mean simply "soil type," giving rise to a great deal of further misunderstanding and, sometimes, hot argument.</p>
<b>Thermovinification</b>	<p>The process of heat treating grapes or must to enhance the extraction of anthocyanins; if they are heated above 60 °C (140 °F) it can also inactivate laccases that may be present due to fungal infection.</p>
<b>Thief</b>	<p>A thin vessel, attached to a string, lowered into a tank or barrel to get a sample. Also, a glass or plastic tube with a</p>

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	handle used for obtaining samples from barrels or puncheons.
<b>Thin</b>	Term used in sensory evaluation referring to a wine that lacks body, viscosity, alcohol or sugar. Often this term refers to wine from a poor vintage in which the grapes failed to ripen fully.
<b>Tirage</b>	(Tier-âhh-j) Production term that describes the first bottling step, which turns a new wine into Champagne or Sparkling Wine. The wine is bottled with its yeast and sugar. After the <i>tirage</i> , the new Sparkling Wine is aged on the yeast, then riddled, disgorged and, finally, labeled for sale.
<b>Titrateable acidity</b>	Titrateable and total acidity are often confused. The AOAC used both interchangeably. Total acid may be defined as the concentration of organic acids in grapes. It is a measure of the hydrogen ion concentration plus the potassium and sodium ion concentration. Titrateable acidity is only a measure of hydrogen ion consumed by titration with standard base to a defined end point, usually pH 8.2. Titrateable acidity depends on both the amount of acid present and the pH. Expressive of level of acid present in juice or wine. In Europe, expressed as g/l as sulfuric acid. In the U.S., in g/l or, more often, g/100 ml, as tartaric acid. Value range between 0.3 and 1.3 g/100 ml. Even though our standard methods of analysis give titrateable acidity, many winemakers still call it total acidity.
<b>Topping</b>	The act of filling a barrel or tank to the very top with liquid, usually wine of the same type and vintage. Contrary to popular belief, topping adds a little air to the barrel being topped rather than protecting the wine in the barrel from air.
<b>Translocation</b>	Movement of water and nutrients from one part of a grapevine to another.
<b>Transpiration</b>	Loss of moisture from a vine by evaporation through tiny pores in the leaves.
<b>Triangle test</b>	A method designed to determine whether two samples can be distinguished.
<b>Troncais</b>	Name of a forest in central France and the French oak wood (for barrels) shipped from the Troncais region. Troncais oak is tight-grained compared to Limousin. See Alliers, Limoges.
<b>Ullage</b>	The empty space above the liquid in a wine bottle (or wine barrel or tank) usually after long storage. Ullage comes from the French word <i>ouillage</i> . Older wine bottles typically have a little more space, or ullage, than younger wines because more of the wine has seeped out and evaporated away with time. Ullage is used as an indicator of how well a cork seals its bottle (in a very old wine, little or no ullage usually indicates that the wine will be sound and unspoiled when opened). Large amounts of ullage in an old bottle of table wine is a sure sign that the wine is dead, since some of the wine has leaked (or evaporated) out past the cork. When liquid has leaked out, you can bet that air has leaked in.

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<b>Variety</b>	A clone, or series of related clones, propagated vegetatively from a single parent plant (monoclonal origin) or several genetically similar parents (polyclonal origin). Cultivar is used interchangeably.
<b>Véraison</b>	The first color change from green to purple on the vine (in black grapes) or green to yellow-green (in white grapes), accompanied by a softening of the texture. This is the first step in the maturation of grapes on the vine.
<b>Vigneron</b>	Common French word for winegrower or winemaker.
<b>Vignoble</b>	Common French word for winegrowing area.
<b>Vigor</b>	A measure of quality of growth expressed by a grape vine, as opposed to capacity that measures quantity of growth and development.
<b>Vin</b>	French word for wine ( <i>vino</i> in Spanish or Italian); widely used in other languages as well.
<b>Viña</b>	Spanish word for vineyard. Widely used in California as part of the name of a wine property.
<b>Vinifera</b>	Scientific name of the primary species of <i>Vitis</i> (vines) used for winemaking. <i>Vitis vinifera</i> produces nearly all the world's wines.
<b>Vinification</b>	The act of winemaking, including all the operations and processes involved.
<b>Vinous</b>	Tasting term to describe the “wine like” smell or taste which is common to all grape wines, whether varietal or not. Sometimes wine judges, when confronted with a so-so wine that lacks varietal flavor may call the smell “vinous” but without other special attributes.
<b>Vintage</b>	The “year” or season of winegrowing. Vintage wine is defined in the US as wine which is produced at least 95% from grapes harvested in a single, stated year. In virtually all other wine producing countries, the rule is less strict: A wine qualifies as vintage if at least 85% of the wine in the bottle was produced in the year stated.
<b>Viscosity</b>	The perception of the resistance of wine to flow; a smooth, velvety mouth-feel.
<b>Viticulture</b>	The scientific investigation of grape cultivation.
<b><i>Vitis vinifera</i></b>	The primary grape genus and species cultivated and used as a source of wine, spirits, table grapes and raisins.
<b>Volatile</b>	Evaporating into air. Can also be used to describe a wine smelling vinegary.
<b>Volatile acidity (V.A.)</b>	The acetic acid or vinegar content of a wine. Used as an index of bacterial activity since volatile acid arises only from

# Glossary of Terms for Enology, Viticulture and Winemaking

	microbial spoilage of wines in the presence of air. The bacteria, growing in the wine, actually change a little of the alcohol into acetic acid, using whatever oxygen they can find.
<b>Wild yeast</b>	Species or strains of yeast that occur on grape surfaces or are on winery equipment or walls. Can initiate fermentation.
<b>Wine spirits</b>	Distilled wine used to fortify wines such as sherry or port; it may be highly rectified to produce a neutral flavored source of high proof alcohol.
<b>Wood tannin</b>	Tannin that came originally from wood, as in a wine that was oak-aged.
<b>Woody</b>	Tasting term for a wine in which the effect of prolonged contact with wood is noticeable.
<b>Xylem</b>	The woody, center portion of a vine trunk, arm or cane, including everything inside of the cambium layer. Xylem includes heartwood at the center of a vine trunk (composed of older, dead cells) and sapwood outside of the heartwood but inside the cambium layer (composed of living cells), which transport water and dissolved substances upwards from the roots towards the leaves.
<b>Yeast</b>	A primarily unicellular fungus that divides by budding (or fission) and possesses a glucan or mannoprotein cell wall (budding yeast may contain some chitin around the bud scar). Yeast can occur naturally in the air, especially in areas where fruits are grown. Whether “wild” or “cultured,” yeast can quickly metabolize natural sugar into alcohol and carbon dioxide (called fermentation). When all, or most, of the natural sugar of grape juice has been transformed into alcohol, the juice is legally “changed into wine.”
<b>Yeast hulls</b>	Called ghosts. The partially purified cell-wall remains of yeast.
<b>Yeast lees</b>	Solid sludge-like sediment, primarily spent yeast, which settles to the bottom of a fermentation tank after the fermentation is completed.
<b>Yield</b>	The fruit crop can be reported in tons per acre. Ranges have been reported from ½ to 75. The 75 tons/ace was claimed by a Lodi Tokay grower!

Terms taken from several sources. Most notably Geraldine Ritchie, Richard Petersen, [Principles and Practices of Winemaking](#), Emile Peynaud, [Webster's Ninth Collegiate Dictionary](#), Maynard Amerine, Frank Schoonmaker, Bruce Zoecklein and many I can't remember where else.