**Group 3 – Laser**

Condahan, Christine Joy

Deiparine, Dana Indira

Galeon, Christie Joy

Kadil, Sherifa Rosslaini

Tabudlong, Filbert

**Basic Steps to Make Wine**

The essential steps in winemaking can be summarized as follows:

1. Extract the flavor and aroma from the base ingredients by chopping, crushing, pressing, boiling or soaking them.
2. Add sugar, acid, nutrients, and yeast to the fermentation media or liquor to achieve the proper ratio and ferment, covered, for 3 to 10 days in a primary fermentation vessel (crock, jar or polyethylene pail) at 70-75 degrees Fahrenheit.
3. Strain off the liquid from the pulp, put it (the liquid) into a secondary fermentation vessel (a carboy or jug), fit a fermentation trap (airlock) on the mouth of the bottle, and allow fermentation to proceed at 60-65 degrees Fahrenheit until all bubbling ceases (after several weeks).
4. Siphon the wine off the sediments (lees) into another clean secondary fermentation vessel. Reattach the fermentation trap. Repeat after another one or two months and again before bottling.
5. When wine is clear and all fermentation has stopped, siphon into wine bottles and cork the bottles securely. Leave corked bottles upright for 3-5 days and then store them on their side at 55 degrees Fahrenheit for six months (white wine) to a year (red wine) before sampling. If not up to expectations, allow to age another year or more.

### Detailed instructions for each of the five steps:

You can make this process as complicated and exacting as you please, but in fact it need not be. Recipes have been developed over the centuries which pretty much make this a simple process of measuring, squeezing and siphoning. Sure, there are ports and sherries and Madeiras which require a few extra steps and exactitude, but even these methods were developed hundreds of years ago by people far less sophisticated than you, so I'm wagering that you can master even those techniques if you decide to do so. Further, there are recipes and there are dissertations on organic chemistry. While some authors seem to try their dardest to make the whole process seem tedious, exacting and highly technical, others try to get you from fruit to wine as simply as possible. I'd like to think I fall into the latter category, despite the fact that I absorb as much of the technical details as I can.

It certainly doesn't hurt to know about the finer, more exacting points of winemaking. Indeed, these *do* help in making better wine. But in fact, you don't really need to know them to make pretty good vino. But to assist the viewer who *wants* to know them, I've put together a section I call "Advanced Winemaking Basics." It's supplemented by a section devoted entirely to "The Miracle of Yeast," a subject so large as to demand it's own section. You can view these at your leisure or ignore them altogether and go straight to the recipes, because the wine is in the recipes.

## *EXTRACTING FLAVOR*

*"The base [base ingredients] is where the wine's flavor and aroma comes from."*

The first essential step in winemaking is to extract the flavor and aroma from the base ingredients by chopping, crushing, pressing, boiling or soaking them. This can be done in several ways. The recipes on this site each select and specify a particular method for accomplishing this.

WHOLE FRUIT OR BERRIES: If you begin with whole fruit or berries, there are four basic methods of extracting flavors and aromas. The base is first prepared. It might be peeled or not. Seeds (pits) might be removed or not. Immature (not yet fully ripe) fruit or berries are culled (removed), as are those showing signs of over-ripeness (brown spots, mold, rot) or bird or insect damage. After washing to remove dust, bird droppings, insects and pesticides, the extraction method is selected. Placing the fruit or berries in a nylon straining bag before it is placed in the primary greatly eases the later removal of the pulp from the must.

* *Cold maceration*. The fruit or berries are crushed or chopped or sliced and placed in the primary fermentation vessel (called simply *the primary*). Sugar, water and sulfites (crushed Campden tablets or potassium metabisulfite), as specified in the recipe, are added and stirred in well and the primary is covered and set aside for 8-10 hours. Then pectic enzyme is added, stirred in well, and the primary is refrigerated for a specified period (usually 24-48 hours). It is then removed and allowed to return to room temperature. Additional ingredients are then added, stirred in well, and the yeast culture (in the form of a starter solution) is introduced.
* *Hot water extraction*. The fruit or berries are crushed or chopped or sliced and placed in the primary fermentation vessel. The necessary amount of sugar is added and boiling water is poured over the fruit and sugar. A sanitized wooden spoon or paddle is used to stir the must to help dissolve the sugar. The primary is covered and set aside to cool to room temperature. Additional ingredients are then added in a timed fashion according to the recipe and then the yeast culture is introduced in a starter solution.
* *Direct heat extraction*. The fruit or berries are crushed or chopped or sliced and placed in a stainless steel cooking pot. A small amount of water is added to prevent scorching and the pot is placed on the stove on medium-high heat until the juices begin to flow from the base. Usually, the liquid is not allowed to boil. The base is stirred to heat it evenly. After a set amount of time, it is removed from the heat. The liquid is usually fermented without the pulp, but in some cases the pulp is left in the liquid and the two are fermented together. If the liquid only is to be fermented, the base is either strained hot or allowed to cool before being strained. The fruit and berries, or just the juice, are placed in the primary for fermentation. The sugar and water may be added while still hot, but most other ingredients are not added until the mixture cools to room temperature. This method is only used for particular reasons, as the cooking adds another flavor component to the finished wine that many find objectionable.
* *Fermentation extraction*. The fruit or berries are crushed or chopped or sliced and placed in the primary fermentation vessel. Other ingredients, including sugar, water, sulfites, pectic enzyme, acid blend, yeast nutrients, etc., are added in a time-dependent fashion and then the yeast culture is introduced in a starter solution. Flavors and aromas are extracted by the fermentation action of the yeast on the must. This occurs at a normal (room) ambient temperature.

FRUIT JUICE OR CONCENTRATE: Concentrates are reconstituted (diluted with water) into juice before fermenting. Other ingredients are added to protect and balance the must after it is placed in a primary. Always begin fermentation in a primary, without an airlock, unless specially instructed to begin in a carboy. The inoculate (yeast culture added to the juice) needs exposure to oxygen for the first 48-72 hours to assist the yeast in rapid reproduction and increase the population to a density suitable for rapid fermentation.

FLOWERS AND LEAVES: Some of the best wines are made from flower petals. Dandelion, rose petal and hibiscus are three flowers that make excellent wines. Honeysuckle, cactus flower, tulip, red or white clover, and coreopsis also make wonderful wines. Flavor is usually extracted by one of three methods. Place the flowers (usually just the petals) in a nylon straining bag to reduce cleanup time and effort. Brambles, vine prunings, nettle tops, and leaves of selected trees and herbs are processed the same as are flowers and petals.

* *Hot water extraction*. The flowers or petals are placed in the primary fermentation vessel. The necessary amount of sugar is added and boiling water is poured over the flowers and sugar. A sanitized wooden spoon or paddle is used to stir the must to help dissolve the sugar. The primary is covered and set aside to cool to room temperature. Additional ingredients are then added in a timed fashion according to the recipe. The mixture is sometimes allowed to steep for some time and then brought to a boil in a stainless steel pot, allowed to cool, and then placed in primary. When cooled and fortified with all additional ingredients (acid blend, tannin, yeast nutrient, etc., the yeast culture is introduced in a starter solution.
* *Direct heat extraction*. The flowers or petals are placed in a stainless steel cooking pot. A small amount of water is added to prevent scorching and the pot is placed on the stove on medium-high heat and brought to a boil for a set amount of time. It is removed from the heat and poured through a straining bag or muslin cloth draped in a funnel. The liquid is allowed to cool and transferred to a primary. The sugar and remaining water may be added while still hot, but most other ingredients are not added until the liquid cools to room temperature.
* *Fermentation extraction*. The flowers or petals are placed in the primary fermentation vessel. Other ingredients, including sugar, water, sulfites, pectic enzyme, acid blend, yeast nutrients, etc., are added in a time-dependent fashion and then the yeast culture is introduced in a starter solution. Flavors and aromas are extracted by the fermentation action of the yeast on the must. This occurs at a normal (room) ambient temperature.

*ADDITIVES AND OTHER INGREDIENTS*

*"The additives and other ingredients protect and balance the must."*

The second essential step in winemaking is to add additional ingredients to the base and ferment in a primary for 3 to 10 days at 70-75 degrees Fahrenheit.

Unless we use boiling water or direct heat for flavor extraction, or unless we use pasteurized juice or frozen concentrate, it is important that the must be protected against bacteria and mold from the earliest moment, and against oxidation. We do this by adding sulfites to the must in the form of crushed and thoroughly dissolved Campden tablets or powdered potassium metabisulfite. This does not *sterilize* the must, but brings it to an *aseptic*level of protection against microscopic organisms that can do terrible things to wine. Just as importantly, the addition of sulfites creates both bound and unbound (free) sulfur in the must. The later occurs most notably as sulfur dioxide gas, which tends to fill the spaces between molecules of solid and liquid matter in the must. This is *real* important, because those spaces are normally filled with oxygen atoms and they react with other molecules in the wine to eventually reduce it to something undrinkable. Oxidation is the death-blow for all wine, so getting rid of that oxygen and replacing it with sulfur dioxide helps protect and prolong the life of the wine. But it also retards the tendency of all white wines to turn brown and red wines to turn brickish (reddish-brown). Finally, they also inhibit the early growth of most wild yeasts that find their way into musts (on the skins of grapes, fruits, berries, flowers, leaves, and other natural ingredients), while cultured wine yeasts are largely sulfite tolerant. This allows the cultured yeasts to grow quickly without competition and dominate the must. So, even if the recipe doesn't say to add sulfites, add them as early in the process as practicable. They can even be added to warm (but not hot) must. The normal dose is one crushed and dissolved Campden tablet to each gallon of must, or 1/4 teaspoon of potassium metabisulfite to each 5 gallons of must. Do not add more than this, as too much is in some cases worse than not enough.

Pectic enzyme is an additive to most fruit and berry musts. It not only breaks down natural pectin found in most fruit, but also helps break down the cell walls in the pulp and skins and make it easier to extract the flavors, aromas, acids, tannins and other and components that contribute to the complexity of finished and aged wines. It is best to wait a few hours after adding sulfites (Campden tablets or potassium metabisulfite) before adding pectic enzyme, as its action is retarded by an excess of sulfur dioxide. After 8-10 hours, however, it is quite safe to add it. It comes in either liquid or powdered form. The liquid is more concentrated and preferred by commercial winemakers, but it has a very finite shelf life and must be refrigerated to even achieve that. It also varies in strength from different manufacturers and cannot be reliably included in recipes, whereas the powdered form is fairly constant among manufacturers, does not require refrigeration, and can be kept for several years without losing its ability to reduce pectin. Pectic enzyme works best at cooler temperatures. Do not add it to musts above 75 degrees F.

Except for perfectly ripened wine grapes, most musts require acid adjustment to achieve balance. Some fruit and berries contain too much acid and need dilution with water to bring their acidity to acceptable levels. But most are acid-deficient to begin with and acidity needs to be added. Recipes most generally call for the addition of acid blend, which is a mixture of citric, malic and tartaric acids in crystalline form. Many recipes, especially older ones, use citric acid in the form of orange or lemon juice (or both). One can buy crystalline citric, malic and tartaric acids. These have very long shelf lives and can be used to change the acid profile of a wine, especially the finish and after-taste. Acids can be added at any time before yeast inoculation.

The *bite* in wines is produced by tannin, a natural component of most fruit and berry skins, seeds and stems. But most white wines lack sufficient tannin to produce a bite, and so tannin is generally added in small amounts to help balance the wine's astringent side. Do not overdo it. A 1/8 to 1/4 teaspoon amount is usually sufficient to give the wine that "something" it needs. Tannin is usually either grape or gallic in origin. Grape tannin is preferred. It is brickish in color and has a shelf life of many years. But it does not dissolve well if added to liquid. Add it to a clean juice glass and then pour a little water or fruit juice in on top of it. Stir it briskly with a fork or small whisk to dissolve it and pour that into the must.

Except for well-ripened wine grapes, almost all other winemaking bases lack the nutrients required by yeast to produce a good, thorough fermentation. Yeast nutrients contain a variety of trace minerals, but especially nitrogen. For a sterile must (one without any natural nutrients whatsoever), 1-1/2 to 2 teaspoons of nutrients per gallon of must might be required, but for most wines made from other than wine grapes, a teaspoon of nutrients is sufficient. Do *not* mistaken yeast *energizer* for yeast *nutrients*. Energizer is used rarely and then sparingly, with only 1/4 teaspoon per gallon being sufficient to do what it is meant to do. It is rarely added to a must before the beginning of fermentation (an exception is for blueberry wine) and is really only called for when a fermentation turns sluggish (slows considerably while still possessing plenty of unfermented sugar) or sticks (stops fermenting while still possessing considerable unfermented sugar) altogether. It is not a substitute for yeast nutrient.

Sugar is essential for making wine, as without it the yeast will not produce alcohol. Natural sugars in the fruit, berries or juice are often insufficient to produce anything stronger than a weak cider. Most recipes simply call for sugar. This means white, granulated cane or beet sugar. Do not use powdered sugar at all, and only use brown or raw sugar in small quantities unless a larger amount is specified in the recipe. Corn sugar can be used in direct proportions to granulated. Fructose (fruit sugar) is sweeter than other kinds and should be used only when a sweet wine is desired or in sweetening a wine after fermentation. Honey can be used in lieu of sugar, but use 1-1/4 pounds of honey for every pound of sugar called for. Be sure to check the Glossary of Winemaking Terms on this web site for each of these additives, including sugar.

Another essential ingredient found in every must is water, whether added by the winemaker or contained in the juice to be converted to wine. It is not recommended that distilled water be used at all, with the possible exception of topping up a carboy with too much air space between the wine and the bung/airlock. If your local tap water tastes bad enough to require you to buy bottled water for consumption, then at least use spring water in your winemaking. Distilled water contains none of the trace elements essential to yeast health, while spring water always contains what yeast need. This need is in addition to trace elements included in yeast nutrient. If your tap water is biologically untrustworthy (contains microorganisms detrimental to your health), then by all means do not use it unless you bring it to a full boil for 10 minutes first. Do not top up with recently boiled water -- allow it to cool down to room temperature first, as yeast die at 104 degrees F.

Yeast make the wine and therefore are essential to the process. If you use fresh ingredients, such as fruit, berries or herbs, yeast will come into your wine from outside naturally. They also float in the air in almost every kitchen, so that a fruit juice left uncovered for an hour on the kitchen counter will collect a culture. Neither of these yeasts should be used in making wine, nor should baking (bread) yeast. The yeast on fruits and berries are wild, and probably contain strains of yeast unsuitable for wines. Some produce off-flavors and odors, while others only produce small amounts of alcohol. Yeasts found in the kitchen air are generally bread yeasts and also do not make enough alcohol for most table wines. More importantly, molds also float around in the kitchen and will ruin an otherwise perfect must. Inhibit these yeasts with sulfites and inoculate your must with cultured wine yeast strains. Hydrate the active dry yeast (ADY) cultures in a starter solution and allow them time to begin reproducing themselves. The more yeast you add to your must, the sooner they will convert it to wine. A 5-gram sachet (packet) of ADY is sufficient to inoculate a 1- to 5-gallon batch, but if you allow it to begin in a good starter solution it will double in population in about two hours. During the first 48-72 hours in the must, the yeast population will double many times.

Always begin fermentation in a primary, without an airlock, unless specially instructed to begin in a carboy. The inoculate (yeast culture added to the must) needs exposure to oxygen for the first 48-72 hours to assist the yeast in rapid reproduction and increase the population to a density suitable for rapid fermentation. If the must has been sulfited, they need the large surface area to take in the oxygen needed. The top of the primary need only be covered with a clean cloth of tight weave, such as muslin, held in place with an elastic band. If you have a primary with rigid lid drilled for an airlock, use the lid but plug the hole with a ball of cotton for the first few days.

*TRANSFER TO SECONDARY*

*"Begin the anaerobic fermentation."*

The third essential step in winemaking is to additional ingredients to strain off the liquid from the pulp, put it (the liquid) into a secondary fermentation vessel (a carboy or jug), fit a fermentation trap (airlock) on the mouth of the bottle, and allow fermentation to proceed at 60-65 degrees Fahrenheit until all bubbling ceases (after several days to weeks).

Transfer does not mean rack. While the solids are strained off and discarded, the liquid and lees are poured through a funnel into the secondary. The lees are important at this stage because many of the live yeast cells will have settled into the lees. Without them, fermentation will get very sluggish or stick (stop altogether). The best procedure is to stir the wine to get the lees into suspension, then pour the liquid through a large funnel into the secondary. If the funnel has a fine-mesh screen insert, use it to filter out the gross lees (large bits of pulp). The fine lees, containing the yeast, will pass through the mesh.

The timing of the transfer has long been the subject of debate. In most of the 20th century, the commonly accepted procedure was to ferment for three to five days and then transfer regardless of specific gravity. The set number of days was usually arrived at by averaging the time it took to ferment enough sugar to reduce the specific gravity to between 1.050 to 1.030. The idea was to get the wine under airlock so it could begin a true anaerobic fermentation, or fermentation without access to oxygen. The reason for this is because this is when the yeast converts sugar into alcohol and carbon dioxide while extracting energy from the transformation. More recently, it was discovered that yeast create a micro-anaerobic environment around themselves as they submerge by using whatever oxygen atoms are trapped in the spaces between molecules surrounding them. Only when they float up to the surface are the possibly exposed to oxygen, and after the first 48-72 hours atmospheric oxygen has been replaced with carbon dioxide created by fermentation. Thus, the old idea of getting the wine under airlock quickly to create an anaerobic environment was shown to be mostly irrelevant and a new practice was adopted.

Today the accepted practice is to keep the wine in the primary until the vigorous fermentation subsides. This normally occurs at around specific gravity 1.010. As the vigorous fermentation subsides, the production of carbon dioxide slows considerably and oxygen is able to migrate down through it to the surface of the wine. Free sulfur dioxide still protects much of the surface wine from absorbing oxygen, but sulfur dioxide is a gas and slowly escapes the wine. The intermolecular spaces vacated by the sulfur dioxide are filled either with carbon dioxide rising through the wine or by oxygen scavenged from the atmosphere by the wine -- a natural ocurrance. So, as the vigorous fermentation subsides, the wine becomes more vulnerable to oxygen uptake. This is the best time to transfer the wine to secondary.

The best way to accomplish the transfer without exposing the wine to more oxygen than is necessary is to tilt the funnel so that the wine escaping it slides down the inside of the carboy rather than drop free-fall through the air to the bottom. This may require the tilting of the carboy itself, but simply tilting the funnel means this is a two-person operation. An alternative procedure is to fit a hose or tubing to the bottom of the funnel that extends to the bottom of the carboy. This, too, minimizes air contact.

Another way to minimize air contact while transferring the wine to secondary is to fill the carboy with carbon dioxide. A small bottle of compressed CO2 will do this most efficiently. As the carboy fills with CO2, it settles and fills the carboy from the bottom up, pushing oxygen-laden air up and out of the carboy. The trick is to not fill the carboy too quickly, thereby allowing the CO2 to settle. Argon is another inert gas that can be used in the same way to protect the wine against exposure to oxygen-laden air, but both methods are really unnecessary if care is taken in tilting the funnel appropriately or using an extension hose or tubing as described.

It sometimes happens that everything in the must is just perfect for the yeast and they ferment the must to absolute dryness in only two or three days. When this happens (a hydrometer reading will show the specific gravity at less that 1.000), go ahead and rack the wine into the secondary and slap an airlock on it immediately.

When the fermentation in the secondary stops -- that is, when positive pressure inside the carboy stops pushing bubbles through the airlock -- it is essential to use the hydrometer to ensure fermentation is finished rather than stuck. This is only common sense, but it is surprising how many people forget it and assume the fermentation has stuck rather than finished.

*RACKING THE WINE*

*"Get the wine off the lees."*

The fourth essential step in winemaking is to siphon the wine off the sediments (lees) into another clean secondary, reattach the fermentation trap, and repeat after another one or two months and again before bottling.

This procedure is called racking. It is done when necessary, not just two or three times as stated above. The rule is, as long as there are fresh deposits on the bottom after a regular interval (30 to 60 days), even if they are just a light dusting, the wine should be racked. Only when that interval passes and there are no fresh lees -- AND the specific gravity is 1.000 or lower -- is the wine ready to be prepared for bottling.

It is not necessary that the interval between rackings be 30 days, 45 days or 60 days, but it should not be less than three weeks. It is perfectly okay to leave the wine on the lees for three months. Beyond that and the wine enters a danger zone caused by dead yeast cells breaking down -- rotting. While this can cause off-flavors and odors if allowed to go on too long, the bigger danger is the formation of hydrogen-sulfide gas, which smells like rotten eggs and can be the death of the wine. But if the lees are stirred every week or so, neither the off flavors, off odors nor hydrogen-sulfide gas form. Indeed, the wine is actually improved by extended contact with the lees as long as they are stirred frequently.

During this entire period, the sulfur dioxide gas released into the wine from crushed Campden tablets or potassium metabisulfite is slowly dissipated through the airlock and its protective qualities are lost. It is therefore necessary to replenish this protection, and this is done at every other racking. The new sulfites are added to the receiving secondary and the wine racked into it.

As in the transfer of the wine from the primary to the secondary, during rackings the wine's exposure to oxygen-lade air should be minimized. This is much easier to do during racking than during the initial transfer, as the downward end of the racking tube can easily be directed against the inside wall of the carboy or under the surface of the transferred wine. Again, those who are extra cautious can sparge the receiving carboy with carbon dioxide or argon gas before racking the wine into it.

Racking can be made easier by attaching a racking wand to the racking hose. A racking wand is a rigid, L-shaped plastic tube that allows you to better control where the bottom of the take-up is located. The take-up end of the wand is fitted with a protective cover that allows the wine to enter the wand from above rather than below. This helps prevent it from sucking the lees below it into the receiving secondary. A racking clip can also be attached to the mouth of the carboy to hold the take-up end of the wand at a determined height (or depth). This depth should be midway between the surface of the wine and the lees, and adjusted periodically to maintain that aspect.

Racking is not as difficult as many new winemakers make it. There is no reason to agonize over racking at an exact interval, or leaving the wine in contact with the lees an extra week -- or even a month. But is is prudent not to be sloppy about it, and to sanitize all equipment with sulfited water or a specialized sanitizer before and after use. Cleanliness in winemaking is everything.

*BOTTLING THE WINE*

*"There is more to finishing the wine than bottling it."*

When the wine is clear and all fermentation has stopped, siphon it into wine bottles and cork the bottles securely. Leave bottles upright for 3-5 days and then store them on their side at 55 degrees Fahrenheit for six months (white wine) to a year (red wine) before sampling. If not up to expectations, allow to age another year or more. While this is the essence of this step, there is actually a bit more to it.

It is assumed the wine will fall clear on its own within six months and perhaps another three rackings. Almost all wines will, but some may need help. Help means either cold settling or fining. It does not mean filtering, as only clear wines should be filtered. Filtering a cloudy or hazy wine will almost always clog the filters prematurely and could burn out a filter's pump.

Generally, fining agents work because they possess one charge (positive or negative) and the cloudiness is caused by something that possesses the opposite charge. Opposites attract, creating larger (and heavier) particulates, which fall into the lees. If you use the wrong fining agent, it will repel the particulate and serve no purpose. Indeed, it could exacerbate the problem.

After the wine is clear, it must be stable before being bottled. Stable means all fermentation has stopped for good. An unstable wine can resume fermentation in the bottle and lead to disaster -- a popped cork or exploded bottle.

Any wine that is absolutely bone dry will stabilize itself within a few days to weeks, as no food remains to keep the yeast alive. For bone dry wines (specific gravity of 0.990 or lower), allow them to sit for 30 days before bottling.

If the wine is not bone dry, it may be cold stabilized at 30-32 degrees F, for 3-4 weeks. This will kill all popular strains of wine yeast. If you cannot reliably reduce your wine to this temperature range for an extended period, you can chemically stabilize it.

Potassium sorbate, sold as a chemical or behind a product name such as *Sorbistat K*, is a commercial wine stabilizer that should be used in conjunction with Campden or its active ingredient, potassium metabisulfite. In other words, it works better *with* sulfites present than without, and it works better than sulfites alone. Potassium sorbate disrupts the reproductive cycle of yeast. Yeasts present are unable to reproduce and their population slowly diminishes through attrition.

Potassium sorbate is added in the amount of 1/2 teaspoon per gallon of wine. Sorbic acid results and stabilizes the wine. Usually the crushed Campden and potassium sorbate are dissolved in a cup or two of the wine to be stabilized and stirred thoroughly. Allow the stirred wine to sit a few moments and look for small white lumps of undissolved powder. If present, continue stirring until the wine is clear without any undissolved lumps. This is then added to the larger batch and stirred in well with a sanitized glass rod or wooden dowel.

It is not uncommon for wine to absorb carbon dioxide, the gas created as a by-product of fermentation. This especially tends to occur when fermentation slows to the point that bubbles escape the airlock at a rate slower than one bubble every 15 minutes. The positive pressure of CO2 in the headspace between the wine and the airlock bears equally on the wine and the liquid inside the airlock. Some of that CO2 is simply absorbed into the wine. The result is a wine that fizzes when poured. It may not fizz as much as a sparkling wine, but it greatly detracts from a wine that is supposed to be a still (nonsparkling) wine.

There are several ways to release this gas and return the wine to a true still wine. The simplest way is to simply stir the wine with a wooden dowel or a plastic rod. Stir the wine vigorously for about a minute and then replace the airlock and let the wine settle down for 30-45 minutes. Then repeat the procedure several times until the wine stops giving up CO2 gas. One may use a plastic rod used to pull curtains closed. One may heat one end of the rod in boiling water for a few minutes, lay the heated end on a wooden cutting board, and gently tap it with a wooden mallet to flatten the end of it into a narrow "paddle" shape. One can sanitizes it and then puts the paddle end into the carboy and attaches the other end to an electric drill. This is undoubtedly safer than using a wooden dowel because the plastic cannot absorb bacteria or mold the way the wooden dowel can.

All wines benefit from bulk aging before bottling. The length of time a wine is bulk aged is up to you, but whites generally should be aged at least six months, Low acid, low tannin reds should be aged for 9-12 months. High acid, high tannin wines should be aged considerably longer. Aging is usually done under airlock, but long aging can be done in sealed carboys, the seal being provided by a solid bung or tapered cork.

You may bottle the wine with simple racking tubing. I insert the tubing into the bottle at the depth I wish the wine to rise to (1-3/4 inches if using 1-1/2-inch corks, 2 inches if using 1-3/4-inch corks. When the wine rises to that height, I simply lift the bottle above the height of the wine in the secondary. Flow stops and wine above the end of the tubing is siphoned back into the carboy. There are also valves that can be fitted to the end of the tubing and used to cut off wine flow at the appropriate time. Finally, there are bottling wands that fit into the end of the tubing and are inserted into the bottle. They contain a spring-loaded valve that is opened when the tip is pressed against the bottom of the bottle. When the bottle is filled to the appropriate height, the wind is merely lifted and flow stops. The choice is yours. Each method requires a few attempts to become expert at, but there is no rocket science involved and anyone can quickly master either of the methods.

Newly bottled wine should be stood upright for three days. During this period it is labeled and a decorative heat-shrink capsule may be fitted over the corked neck. After three days, it is stored on its side so the cork is fully in contact with the wine.

Bottled wine should be allowed to age in the bottle at least two and preferably three months to recover from the agitation bottling imposes upon it (so-called "bottle sickness" or "bottling shock") and to develop a bottle bouquet.

Source: <http://home.iitk.ac.in/~ashishg/winemaking.htm>