SPARKLING WINE

By the Traditional Method [Methode Champenois]

by Ivan Herbert

Introduction

Making sparkling wine by the traditional method is a four stage process consisting of, preparation of the cuvee, the basic wine; tirage which includes the conversion of the cuvee into the basis for sparkling wine and bottling; remuage, which is the riddling process; and finally degorgement, which is the removal of sediment and dead yeast cells and final capping of the bottles. The overall process takes a minimum of one year but can be extended to two or three or even more years to allow the wine to retain more of the traditional cakebread nose. Most people can't wait so long so that one year is normal.

Although the process extends over a long period of time, the actual activity is confined to two days once the basic wine has been made. Once the cuvee is in the bottle nothing needs to be done until disgorgement approaches.

Preparation of the Cuvee

The cuvee [the basic wine used to produce sparking wine] can be any wine made from grapes or other fruit, either white or red, or any combination. There are however certain requirements that would not normally apply to a still table wine. It is vitally important that the level of free SO2 is below about 30 ppm so as to avoid inhibition of the yeast that will be added to the cuvee. This can pose some problems with regard to oxidation, particularly of white wines, so extra care must be taken to minimise contact with oxygen. Keep the carboy well topped up and consider using CO2 or Nitrogen to inert the atmosphere above the wine. It is also preferable to maintain a higher TA than would normally be the case when making table wine. This fact helps to minimise oxidation in the absence of SO2 protection as mentioned above.

Once you have decided on which wine or blend of wines you will use for the cuvee the acidity [TA] of the wine should be adjusted to around 9 gm/litre [0.9%] and cold stabilised. Frequently when using grapes grown in Nova Scotia it will not be necessary to adjust the acidity upwards! The wine should then be fined using one of the proprietary fining agents such as Super Kleer, however unless using ProElif yeast to ferment the sparkling wine it is not necessary to filter the cuvee, as the clearing process that takes place in the bottle after fermentation has been completed will remove any sediment remaining from the original fermentation.

If you plan to use ProElif yeast, of which more will be discussed later, it will be necessary to filter the wine through a 0.45 micron membrane filter, however this will be done on bottling day.

Tirage [Bottling]

There are two separate procedures here depending upon which type of yeast is to be used. My

personal experience is with standard yeast however this year I will try using ProElif yeast.

If you plan to use regular yeast the fined cuvee should be racked into a large container, usually a primary fermenter. At this point taste the cuvee, it will taste quite acidic and will likely need to be sweetened to balance the acid. This is the difficult part because to some extent the presence of bubbles of dissolved CO2 in the finished product will also offset the acid, so its important not to add too much sugar such that the sugar in the resulting sparkling wine overpowers the acidity resulting in a flabby wine with no crispness. It is of course necessary to use a non-fermentable sugar for this process and I use lactose at the rate of between 5 to 10 gms per litre depending upon your taste. Unfortunately this is a matter of experience, and you won't know if you were correct until next year, so its important to keep notes, and adjust next years lactose addition accordingly. There has recently been some discussion about the use of stevia as a sweetening agent. I haven't used it in wine yet but potentially it should be possible to sweeten the wine at the time of disgorgement, though this would pose additional problems that I'll deal with in the next section.

Once you are satisfied with the balance of the cuvee [sugar / acid / alcohol] then add the fermentable sugar for the bottle fermentation. I use dextrose at the rate of 20 gms /litre, but if you wish to use sucrose the quantity should be reduced by about 25%. Some recommend pre-dissolving the sugar but I have never experienced any problem with adding the sugar directly to the wine and stirring. Avoid violent stirring, as you must keep in mind that the level of SO2 is low and aeration of the wine could result in oxidation. Also add Yeast Nutrient in the form of DAP [Diammonium Phosphate] to feed the yeast just as you do when making the original wine. A rate of 4 gms / litre should be adequate. The choice of yeast is up to you but in the past I have used EC-1118 successfully. It is quite aggressive and produces a fairly dense residue, which helps when disgorging the fermented wine. The yeast should be rehydrated in the usual way and then stirred gently into the cuvee.

The bottles should of course be "champagne" bottles that are capable of withstanding the pressures normally generated by in bottle fermentation. Avoid the use of "sparkling wine" bottles, as those used for the other two methods of producing sparkling wine, charmat and carbonation, do not have to withstand as much pressure. The bottles should be prepared in the usual way by thorough cleaning, rinsing, sanitising with SO2, however where you would normal leave residual SO2 in the bottles when bottling still wine, its necessary to rinse the bottles again to avoid any SO2 residues that might inhibit the yeast. The prepared cuvee should then be siphoned into the bottles, and during this process the cuvee should be stirred gently to keep the yeast in suspension to ensure adequate distribution into all of the bottles. The bottles can then be fitted with bidules and crown capped. The use of bidules, small plastic cylinders that fit in the top of the bottle under the crown cap, help with the disgorging process but I have found that the amount of sediment is often more than the capacity of the bidule so that their efficacy is open for debate.

The bottles should then be stored on their sides in a warm area [about 20 degC] to promote fermentation, and after about a month they can be moved to cool storage to "mature".

If you intend to use ProElif yeast there are some modifications to the preceding procedure. ProElif yeast is encapsulated in a membrane so that all residues remain within the membrane. This is stated to very much simplify disgorging. I will use it this year so I will report back next year. As ProElif yeast does not require to be rehydrated this step can be eliminated, however it is recommended that the yeast be placed directly into the individual bottles, about 1.2 to 1.5 gms per bottle. I expect that the best way to do this would be to determine the volume or number of individual grains that represents 1.2 to 1.5 gms and use a small spoon to place the grains into the bottle.

The remainder of the Tirage process is the same as for regular yeast.

Remuage [Riddling]
This step is designed to move all of the sediment into the neck of the bottle ready for disgorging. Traditionally it was done by hand using a riddling rack consisting of two boards hinged at the top, each board being fitted with holes so designed as to accept champagne bottle necks aligned initially about 45 deg from vertical, all the way to near vertical. Each bottle was turned by hand ¼ turn daily and the tilt was increased at the same time so that after about a month of this daily process all of the sediment would have spiralled down to the neck. Commercially the process is now accomplished using a special rack and a forklift, in a few hours. For home winemakers I have found that it is merely necessary to place the bottles upside down in a case and twist and bounce individual bottles a few times. This seems to have the desired effect. Of course this procedure is only required if regular yeast is used. If you are using ProElif yeast it is [so it is said] merely necessary to turn the bottles upside down and all of the encapsulated yeast and residues will fall into the neck.

Degorgement [Disgorging]
This is the fun part! Beware of flying crown caps and plugs of frozen sediment. In preparation for this process first chill one bottle and open it to check that fermentation has in fact occurred and that the sparkling wine is ready to be disgorged. Assuming that all is in order you can proceed with preparations. Plan to carry out the operation in a cool location where some spillage, and possibly spraying of wine won't cause damage. You will need a small chest cooler with a couple of inches of powdered or crumbled dry ice in the bottom. This is obtainable from Air Liquide or Praxair or others plants that make liquid CO2. Cover a table or bench with a non slippery cloth and have on hand a supply of cotton swabs [Q Tips are fine], a bottle opener to remove the crown caps, a wooden mallet to hammer in the plastic sparkling wine corks, a pair of pliers to twist the wire cork cage and a small funnel to facilitate top up. Pre-chill the sparkling wine, upside down in a freezer for a couple of hours so that the bottles are very cold. Similarly pre-chill a bottle of similar still dry wine, to be used to top up the bottles following disgorging. This is known as "dosage". The pre-chilling is essential to minimise the frothing of the wine when the crown cap is removed. Similarly if warm wine is used for the "dosage" most of it would be ejected by the sudden generation of froth.

Don safety glasses and gloves, and clothes that don't matter too much – certainly not your "Sunday best". Set a large bucket tilted slightly down on the table so that you can direct the crown cap and frozen plug of sediment into the bucket. You are now ready to start. Take the cold bottles out of the freezer taking care to keep them upside down, and stand a bottle upside down in the dry ice so that about 1" of the top of the neck is buried in the ice. Wait about 15 seconds and remove the bottle and check to see if a plug of ice has formed in the neck of the bottle. This might take some trial and error to adjust the length of time in the ice. Too short and the plug won't form, and too long the plug will be bigger than necessary. Aim for about a 1" plug. Once the plug has formed, tilt the bottle away from you and hold it at about 30 degrees to the horizontal directed into the bucket and snap off the crown cap with the bottle opener. Theoretically the cap will be quite forcibly blown into the bucket along with the frozen plug of sediment. If you haven't chilled the bottle sufficiently this will be followed by a considerable gush of wine – if so its back to the drawing board, suspend operations and further chill the bottles. Assuming all goes well quickly set the bottle upright on the table, swipe the cotton swab around the inside of the neck to remove any remaining frozen sediment, place the funnel into the neck and top up the bottle with wine. This process should be completed in a very few seconds because it won't be long before the surface of the wine will warm and start a gusher. It would help to have a good idea of where the proper level of the wine should be and to have plenty of light so that you can see through the bottle, and the frozen froth which by now will almost certainly be welling over the neck of the bottle. Then place the plastic cork in the neck and push it down as far as you can before resorting to the mallet. This is why you need a non slip cloth on

the table, because if you happen to not push down completely vertically the bottle, being wet and slippery, will scoot out from under your hand with, usually, dire consequences. When the cork is well in place TAP not hammer it home with the mallet and then secure the wire cage making sure that the bottom ring of the cage is under the ridge around the neck of the bottle. One down many more to go.

As you become experienced you will be able to put more than one bottle at a time in the ice, thus speeding up the overall operation. Of course if you have a second pair of hands available then the speed of the whole process is limited only by the length of time that it takes to freeze the plug of sediment.

I earlier mentioned the possible use of stevia, instead of lactose, to sweeten the wine. I have no direct experience with this but I expect that the advantage of stevia would be to enable a decision on sweetening to be made by tasting a fermented bottle and carrying out careful trials to determine the amount required.

As stevia is claimed to be 200 times sweeter than sugar only very small amounts are required. It usually is available in a dropper bottle, but even one drop might be too much so I suggest preparing a solution of [say] one or two drops in 100 mls of distilled water. Using this to sweeten the trial wine, it should be possible to determine how much of the solution would be required and this amount can then be added at the time of dosage using a syringe. It wouldn't work to add the stevia to the dosage wine because the quantity of dosage wine required varies with each bottle, as the amount lost while disgorging varies quite widely.

Cheers!!