



The reproduction of the grapevine

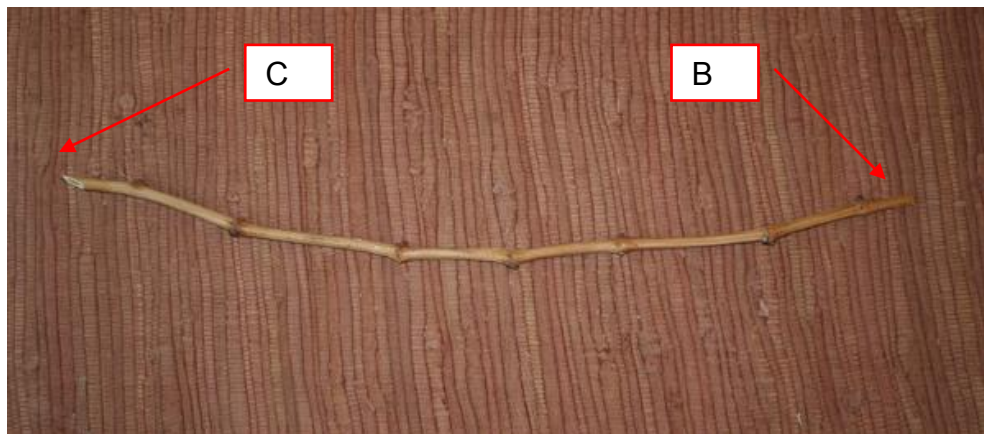
The grapevine can reproduce in different ways and the vegetative reproduction (with clippings or cuttings) is the most common way. Grapevines can also reproduce with seeds from the fruits, but this is difficult and time-consuming. Most of the times, these grapevines will not have true variety characteristics and scientists mainly use the reproduction of grapevines, by means of grape-stones (seeds), to create new grapevine variety.

If you like, you can easily reproduce your own vine from your neighbor's grapevine. All, you need to do is to follow the instructions I am going to give carefully!

First, during the winter (just before spring), when it is time for pruning the vine, cut eight to ten shoots of the previous years' growth from the vine. If possible, take cuttings after there has been enough cold weather to kill any diseases there might have been and to give the canes time to ripen (mature).

The best cuttings are from the base of the cane, near the older stem. Each cutting should have 6 to 8 buds and should be approximately 12 to 16 inches long (figure A), with several nodes (places where buds are located). Avoid cuttings where the wood is soft and spongy and has large piths. Do not use too thick or too thin cuttings; I would say not thinner than a normal pen and not thicker than say one and a half times the diameter of a pen.

Figure A



REMEMBER the vine knows the top from the bottom, so make a square cut at the top, about an inch above the bud (figure B) and a skew or slanted cut at the bottom, right beneath the bud (figure C), so you know which way is up.

Disinfect cuttings with a 5% chlorine bleach solution or try taking healthy cuttings from the grapevine. Observe the vine in bearing to be sure it is healthy. Vines grown from cuttings of a virus-infected vine will also have the virus, so inspect the cuttings for any visible defects.

Place the cutting in sphagnum moss, moist paper or damp peat and store them in a sealed plastic bag in the refrigerator, but not a freezer, so they will stay dormant. The ideal temperature is 32 ° F or 0-1 °C (properly stored, cuttings can be held for as long as a year or even more!)

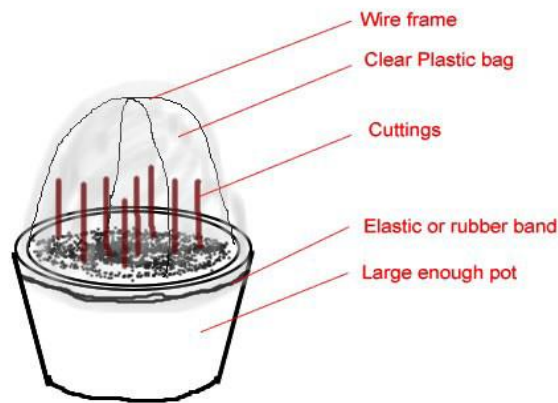
At the beginning of spring, place the cuttings bottom down, in some well fertilized, weed free, planting soil inside a pot. Plant the cuttings deep enough so that at least four buds are covered by the planting soil. You can treat these four bottom buds with rooting hormones available from nurseries or you can order it online, just do a Google search for "rooting hormones". Keep these pots in a humid, warm place (not in direct sunlight), so the conditions will be perfect for rooting. Store the cuttings inside a clear plastic bag, like in the figure shown below. The humidity in the plastic bag is very, very important! I cannot stress this enough, there should always be enough moisture inside the plastic bag!



After about 5 weeks, you will notice some growth, but root growth will take place a bit later. You will notice that callus (a white tissue) forms on the wound made from the cutting. This is normal and can even occur on the sides of the cutting. To decrease the rooting time dramatically, you can put the pot on some source of moderate heat. Be sure not to heat the pot too much! The roots that forms from the cuttings, comes from reserve energy stored inside these cuttings.

As growth begins, you can open the bag slightly by removing the rubber band or, with a sharp pencil, punch some small holes in the bag to admit fresh air. If the vines outgrow the bag, take the plants from the bag. If any of these vines start wilting, just put them back into the bags and gradually expose them to drier air. Without increased humidity, these cuttings with leaves will dry before roots can form.

After you have done this and you see that the new grapevines are strong enough and that there are enough root growth, it is time to plant them out in a nursery row! It should be around the beginning of summer now. Before you take the



cuttings out, you must prepare your soil for the new plants. The next section will explain how to do that.

PS: You need to be careful when taking the cuttings from the pot. Make sure you do not damage too many of the newly formed roots.



Buying cuttings commercially from a nursery.

There are basically two "types" of grapevines you can buy from you nursery. Grafted and non-grafted (rootstock) vines. The grafted vines has a rootstock from another variety and there are a few reason why breeders do that.

There are a few *Vitus Riparia* and *Vitus Labruska* varieties (with really ugly grapes, if any grapes at all!) that is more resistant to nematodes and Phylloxera than some of the varieties used in the wine and table grape industry. Breeders use these varieties as rootstock for the non-resistant varieties, in order to get a more disease resistant vine.

Sometimes, when a variety is a weak grower, and the grape grower needs a more vigorous growing grapevine for some reason, the breeders then use a more vigorous growing rootstock. Never use a vigorous rootstock on highly fertile soils, but instead use these rootstock varieties on dry-land vines or in very dry conditions.

Many of these rootstock varieties are more resistant to certain soil abnormalities like low pH, very wet conditions or even limestone abnormalities. Make sure you know what is going on inside you soil, before deciding on a rootstock.

I personally never plant a non-grafted vine, because of the danger of Phylloxera.

The non-grafted vine is a normal cutting made from a mature vine and and then rooted and planted out. This method is mostly used by the home grape grower as making a scion needs special skills.

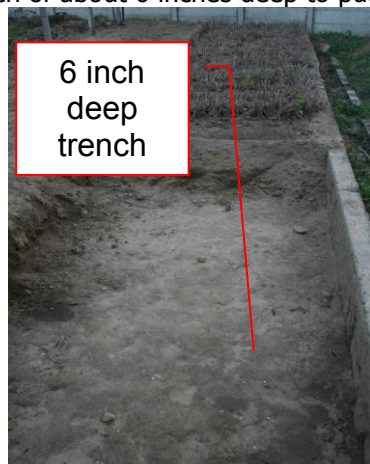
In case you are going to buy a grafted vine from your nursery, there are a few things you should look at:

1. Make sure the graft union has healed properly and that there are no openings between the rootstock and the carrier.
2. Make sure the union is strong by slightly bending the grafted vine - don't over bend it, it will break. If the union didn't attach well, it will brake easily.
3. The rootstock must have well developed, strong roots, with no signs of defects.
4. Take a look at the bark of vine, it should be undamaged with a dark brown color - not black as this can be an indication of some fungus spores (from the previous year)
5. The canes of your vine should have grown at least 8 inches the previous year and preferable there should be more than on cane.
6. No visible roots should come from the graft union - if there are roots, remember to remove them before planting, otherwise your vine loose its resistance to diseases inside your soil.

If you are to grow grapes commercially or buy your cuttings from a nursery, there a few things you should remember when you have received your cuttings.

First and most important: **DO NOT LET THE ROOTS OF THE CUTTINGS DRY OUT UNDER ANY CIRCUMSTANCES.**

Tell the nursery to keep the cuttings in the ground until the day you will pick it up and prepare the propagation bed before you pick up the cuttings. I usually dig a trench of about 6 inches deep to put the cuttings in.



When transporting the cuttings, ensure to cover the cuttings with a damp cloth or plastic canvas. Once you get to your farm, or backyard, and your planting sight isn't prepared yet, you need to put these cuttings in the ground and water them immediately.

Normally, we buy the cuttings bulk, in bundles of 50. Without untying the bundles, put the bundles in the propagation bed – it makes handling them later on much easier.



Lay down a row of bundles and cover 2/3's of the vines with soil from the trench. Compact the soil with your foot and lay down the second row. Ensure you cover ALL the roots with soil – even put some soil on top of the cuttings and wash it in with water. Don't worry if the graft union is covered with soil, you will plant them out in a few days.



New cuttings in propagation bed waiting to be planted out in the vineyard. Here you can see a close up picture of the cuttings in the propagation bed.



Once your soil is prepared, you can remove the cuttings and take it to your vineyard. Again, do not let the roots dry out - PLEASE!



Layering a grapevine

If you have ever tried to replace dead or struggling grapevines in an established vineyard, I am sure you will agree that is a daunting task. You normally struggle to get these vines to the trellis wires because of competition for food and water and because of over shading from the existing vines in the vineyard.

Although it is always advisable to try and replace dead vines with new ones, there might be times when you don't have new vines or if you failed to grow a new vine, then you can use a simple method called "layering".

Layering is done in the dormant season, when you prune your grapevines. All there is to layering, is to make a new planting hole where you want to establish the new vine and then take a cane from the existing vine, bend it down towards the ground and loop it inside the planting hole for about one foot and then up again. To keep the cane in place, before you fill up the planting hole, you can put a stone on the cane and then cover it with soil.

From there you train the grapevine exactly as if it is a newly planted vine. During spring, new shoots will develop from the buds on the layer, then train a new training shoot exactly as I show you in the guide.

Anyway, roots will develop from the buds that are buried under the soil and your new vine will get its food from the existing vine, until the roots of the new vine are strong enough to support the grapevine.

After a year or two, some growers remove the part that is coming from the existing vine, but I prefer to keep it until I am sure the new grapevine is well established and producing a crop.

The disadvantage of using layering is that your new vine will have no rootstock and could be more susceptible to soil



diseases like Phylloxera and nematodes – off course it depends on how susceptible your variety is to those diseases.



This is what the new layer looks like after just a few weeks.



When the new shoots start developing from the buds on the cane you layered, you should remove them as soon as possible. This is a very simple process; just break them off by hand.



As explained later in this book, you should keep an insurance shoot and new training shoot as shown in the guide and train them up the training string as the pictures in the book shows you. Once the vine reach the trellis wires, you can split it (if your training system requires it) or simply train it to the cordon wires and start developing the frame work (as shown in the guide).

You will notice that a training shoot from a layered grapevine grows much faster than from a newly planted cutting. This is because it gets energy and nutrients from the original (old) grapevine.



This picture was taken the next growing season. As you can see, this vine is now a well established vine with a couple of grape clusters already visible.



Growing grapes from seeds

Because it is often very hard to get hold of planting material or cuttings in some parts of the world, grape growers are forced to try and grow grapes from seeds extracted from the grapes they buy in supermarkets or grocery stores.

As said earlier, growing grapes from seeds is not the ideal way of reproducing a grapevine as the genetics of a variety is not completely carried over by the seeds - in other words, if you plant a Concord seed, and you successfully get the seed to germinate, the chances are good that the new grapevine will not have all the true Concord characteristics!

This is a very time consuming process as it can take up to three years to propagate a new grapevine from seeds.

Another big problem with growing grapes from seeds is the fact that a very low percentage of the seeds will germinate. The grape seed is covered with a very tough seed coat that keeps the seed dormant until ideal conditions for germination. The seeds from grapes, needs to go through a process called stratification to obtain a higher germination percentage.

Stratification of grape seeds:

The stratification or cold treatment of grape seeds is essential if you want to succeed with growing a grapevine from seeds.

After extracting the seeds from the berries, you need to put the seeds in peat moss or damp paper towel, inside a refrigerator for at least 2 to 3 months. The peat moss must be kept damp throughout the whole process, but not too wet (soggy). The ideal temperature for stratification is 35 - 40 °F (1 - 3 °C) and should be kept at this temperature throughout the whole process.

Grape seeds can be held in stratification for a long time (even years), as the seeds will not germinate under these cold conditions.

Planting out the seeds:

After stratification, take the seeds from the refrigerator and plant them in seed pots and ensure the temperature is about 70°F (20°C) during daytime. If your climate is cold, you can use heat mats to increase the minimum temperature. Heat up the seed pots at night if your temperature is lower than 15°C.

After a few weeks (if you are lucky), then some of the seeds will germinate. After the seedling is about 1 - 2 inches high, it can be planted out in a bigger pot. Make sure you keep the soil moist, but not too wet. It is advisable to grow the seedlings in the pots for a full year, before planting them out in the vineyard.