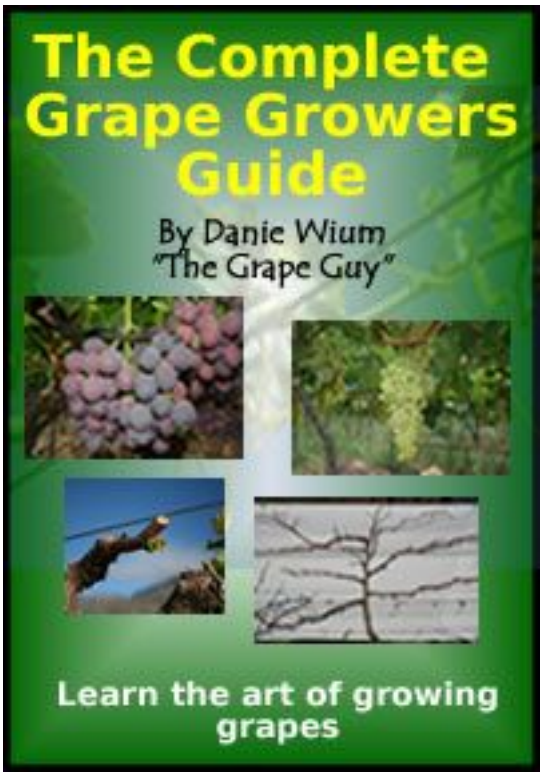
The Complete Grape Growers Guide

By Danie Wium
"The Grape Guy"



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OK, with that out of the way, let's get started! :-)

Welcome message

Hello dear grape friend. Thank you for investing in the Complete Grape Growers Guide. The reason I wrote this e-book, is to give you, the home grape grower a chance to grow your grape vines the correct way.

This grape growing system will take you by the hand all the way from making your cuttings to harvesting your grape crop. If by any chance something isn't clear to you, or you cannot understand some terminology I use, please do not hesitate to contact me. English is my second language and therefore my ways of expressing myself might differ from what you are use to, so please bare with me :-)

Growing grapes is a very specialized field, nevertheless, there are different ways grape growers plant, prune and train their grape vines. The methods I use and will teach you in this e-book is what I do on my farm. As seen on my website, I really do get great results with the methods and my wish is that everyone who owns this e-book will get the same results.

Unfortunately I cannot guarantee this, BUT I will for sure give you EVERYTHING I know about grape vines.

Some info about me and my farm:

After finishing school, I joined the South African Defense Force for a year (in those days it was compulsory). I completed my service year, and went to Elsenburg Agricultural Collage near Stellenbosch. After receiving my diploma in viticulture, horticulture and pomology in 1992, I started farming with grapes, full time.

I have 25 hectares (61 acres) under table grape vines. I have three main sources of irrigation water: streams from the mountain, boreholes and we have a quota with an irrigation scheme here in the Hex River Valley.

All my grapes are prepared by myself and my farm workers. I have 40 permanent workers on the farm, which consist of two team leaders, four drivers, two irrigation managers, two pest control managers and the rest are general workers.

During the busy season (from 10mm or one third inch berry size until the end of harvesting my grapes), I contract another 30 farm workers. As you can see, growing grapes for export, require allot of manual labor.

I hope you enjoy the book and that you will benefit from reading it!

Danie Wium
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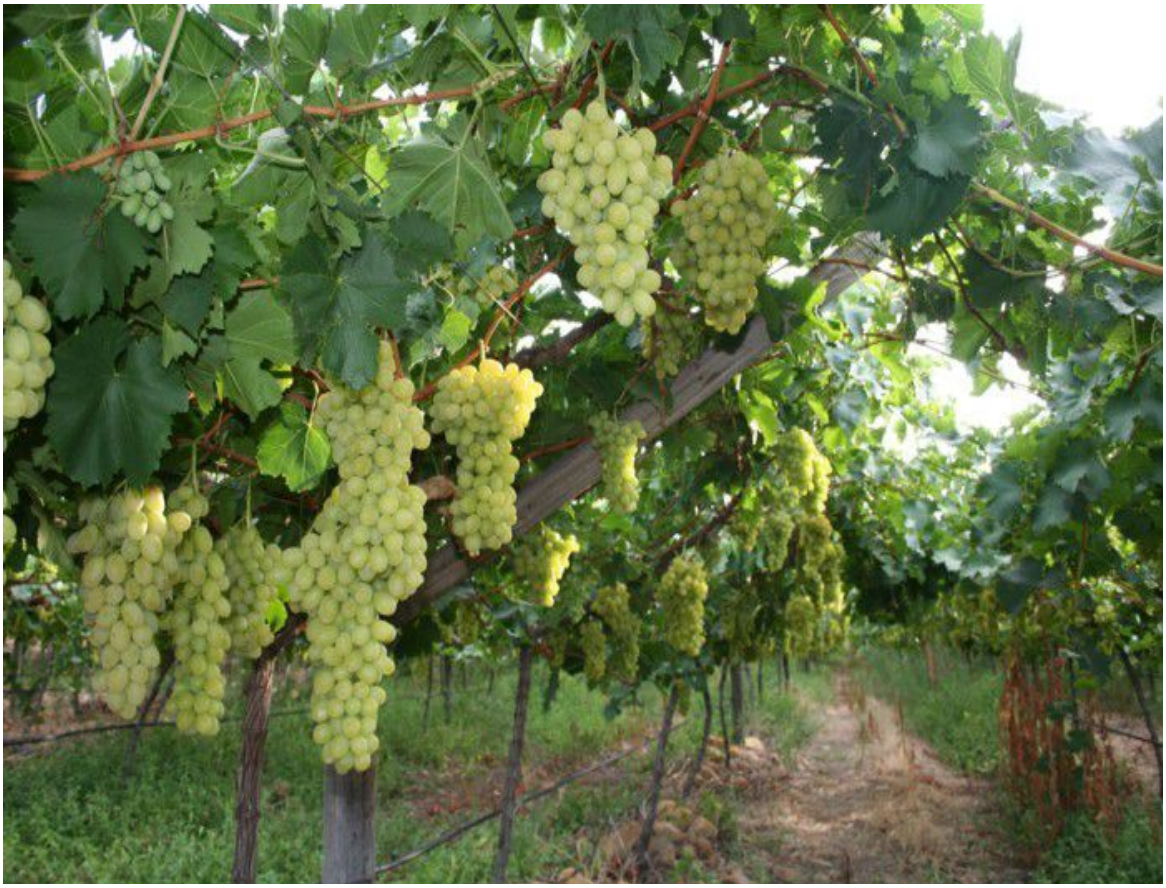


Chapter 1
The history and classification of the grape vine:

If we study the history of the grape vine, we notice that history books mention grapes as far back as 6000 to 5000 BC. In those days, mainly wild vineyards grew near the Caspian see and the Caspian people harvested the grapes for eating.

5000 to 4500 BC, humans planted grape vines in the Middle East and around 2500 BC in Egypt. In the Bible, we find many references to grapes and grape vines, used for making wine and history tells us that the first wine was made 3500 BC by the Assyrians and Egyptians. Round about 600 BC, the French made their first wine in Marseilles and in 200 BC, the Germans in the Rhine-Valley.

The grape vine is a perennial, heterogeneous plant, which means that no cross-pollination needs to take place. During the winter, the grape vine will lose all of its leaves and the lush green shoots will ripen and turn into dark brownish colored, woody canes and will stay dormant in mild to cold winter conditions until the beginning of spring. In some areas, where the winters are not so cold enough, the grape vine will not go fully dormant. This is not ideal for the grape vine, as it builds up reserves for the ensuing growing-season.

The grape vine classifies under the Pmelidaceae (Vitaceae) family. From the ten classes of this family, only one is efficient for eating, or making wine and it is called the Vitus-class. The Vitusclass has round about 32 species of which the Vitus Vinifera (European) and the Vitus Labruska (American) are the well known. The Vitus Riparia, - Rupestris and Berlandieri, are also American species, but most of them do not bear edible or efficient grapes, and is mainly used for rootstock because it's resistant to diseases like nematodes and Phylloxera (*Daktulosphaira*

vitifoliae), a deadly root disease that nearly killed two thirds of the vineyards in Europe in the 1800's!

Today, it is a well known practice to graft Vitus Vinifera on Vitus Labruska and Vitis Riparia.

Chapter 2
The Construction of the Grape Vine

When using this grape growing system, I will often refer to certain parts of the grape vine and for you to understand what I am referring to, we will quickly have a look at how the grape vine is constructed.

Shoots:

Shoots are one year old growth with leaves, buds, grapes and anchors (tendrils).

Canes or long bearers:

Are one year old, dormant wood from which shoots grow. Canes are pruned in many different ways, but normally are about 6 to 12 buds (counting from the base of the cane) in length. On each cane, there are numerous buds that will reveal shoots. These shoots will bear grapes. A grape vine only produce grapes on shoots that develop from either canes or spurs (see the next picture).

Spur or short bearer

Spurs are one year old, dormant wood from which shoots grow. On each spur, there are only two buds that will reveal shoots. These shoots will bear grapes.

Spur with 2 shoots that developed from buds on the spur

Water shoots

Water shoots are shoots that developed from two year and older wood. Normally these shoots do not produce grapes.

Water shoot on old wood

Lateral shoots

A lateral shoot, is a shoot that develops from buds on an existing shoot. The lateral shoot develop between the stem and leave on an existing shoot.

Lateral shoot

Chapter 3
The reproduction of the grape vine

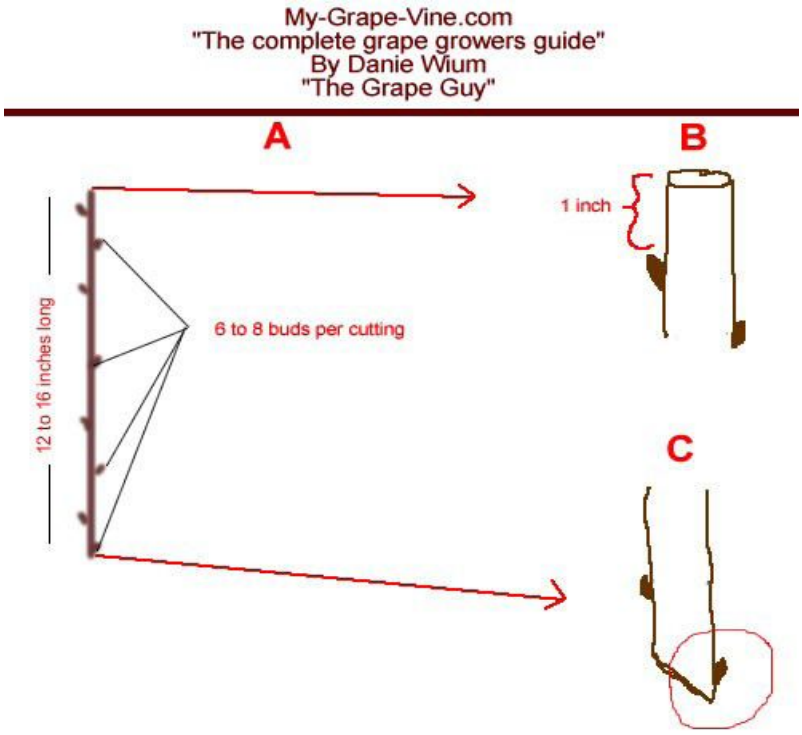
The grape vine can reproduce in different ways and the vegetative reproduction (with clippings or cuttings) is the most common way. Grapes vines can also reproduce with seeds from the fruits, but this is difficult and time-consuming. Most of the times, these grape vines will not have true variety characteristics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

If you like, you can easily reproduce your own vine from your neighbour's grape vine. 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 thing 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.

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 grape vine. 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 º F or 0-1 ºC (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!

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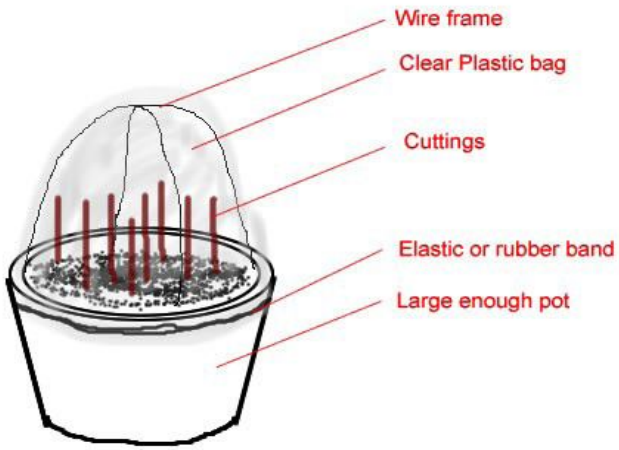


After about 5 weeks, you will notice some growth, but root growth will take place a bit later. You will notice that callus (a white tissue) forms on the wound made from the cutting. This is normal and can even occur on the sides of the cutting. To decrease the rooting time dramatically, you can put the pot on some source of moderate heat (like a heat mat, available from my-grape-vine online store). 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 grape vines 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.

The are basically two "types" of grape vines 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 grape vine 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 CIRCOMSTANCES.**

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.

This is left-overs of wax the cuttings were emerged into, to prevent moisture loss when it was grafted.

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 grape vine

If you have ever tried to replace dead or struggling grape vines 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 grape vines. 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 grape vine 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 grape vine.

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 grape vine 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 e-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 e-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 grape vine grows much faster than from a newly planted cutting. This is because it gets energy and nutrients from the original (old) grape vine.

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 grape vine 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 grape vine 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 grape vine 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 grape vine 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 ºF (1 - 3 ºC) 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 70ºF (20ºC) 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 15ºC.

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.

Chapter 4
Training-systems, trellises and fences

Choosing a training-system and trellis is something you must decide for yourself, as you can train a grape vine to grow and run on almost anything. It is important to have some kind of trellis, as the grape vine cannot support the weight of a full harvest by itself.

After preparing the soil, it is time to lay out the vineyard and to mark the post position on your land. I use chalk dust for this. Now you can dig the holes and start constructing your trellis.

What I will do in this section is to give you ideas on trellises and training-systems. If you do not have a trellis already, it is important to choose a training system that will ensure enough exposure to sunlight and air movement, so that photosynthesis, the ripening of the fruit and the control of diseases can be done properly. The trellis must be strong enough to support the vines as well as a full crop of grapes, and sturdy enough to withstand high winds and other weather conditions.

Build your trellis before you plant the grape vine, as this will ensure that once your grape vine starts growing, you can immediately start training the young vine. Be sure to use treated wooden poles or aluminum poles to withstand the weather, and pests.

For every grape vine you have, you need about 6 to 8 feet of trellis area, so the canes can sprout along the wires on the trellis. The following pictures will show some examples of trellises. Note the dark slanted lines on the sides of each pole, these are wires used to anchor the poles so that they do not move inwards as the grape vines get heavier. Plant the poles on the sides at least 800 mm (2 to 3 ft) deep, as it will carry much strain when the vine grows heavier and will prevent them from pulling inwards. This is very important!

Anchor support at the end posts.

Put the anchor into the hole and cover it with stones to support weight of the vines.

How important is the construction of a trellis or arbor really? Many home grape growers use their grape vines not only to produce grapes, but to ad that something special to their garden and that is understandable, because often grapes are referred to as “the fruit of the gods”.

When the novice home grape grower first plant a grape vine, they passionately dig a hole in the first best place they can find; water the grape vine and soon see some life as new shoots develop from the tiny buds on the canes. The fact that a grape vine is VERY adaptable and not difficult to start, makes growing grapes even more fun.

Soon, the new shoots will be a foot long, and this is even more satisfying, thinking that you have successfully started a grape vine, but then the uncertainty crawls in. What now? What should I do with the new growth? Why isn’t there grapes on my grape vine? I’ve heard about “training” a grape vine, but what on earth does “training” mean?

These are common questions a new grape grower face, and it is understandable, because there is much more to growing grapes than just planting the them!

After a month or so, the newly planted grape vine grows out of control and starts looking more like a shrub than a grape vine. Because of poor airflow and sunlight exposure and the fact that the new shoots is lying on the ground, even more uncertainty crawls in, as diseases starts to take over the grape vine.

Discouraged, the new grape grower tries to save the vine by pruning away shoots and then, thinking that they have successfully managed to keep the vine in shape, they will soon find out that the “new” grape vine now grows even more vigorously. The grape vine will grow even more out of control, as side shoots (laterals) develop because of the tip action that took place.

Even more frustrated, the grape grower starts to do research, desperately seeking for a solution to his/her problem. They do research in magazines, visit some vineyards and even try the Internet (as you did) seeking for answers. They find tons and tons of information on how to grow grapes, and after weeks and weeks of sifting out all the crappy information there is out there, they finally realize that they must have some kind of trellis or arbor to grow their grapes on.

Luckily, they found the answer, but there is another problem! By this time, it is almost the end of the growing season and constructing the trellis or arbor then, will do little or no good! You see, the real disadvantage of constructing the support too late, is the fact that you will have to prune the grape vine back to two or three buds and start all over again, loosing a whole year's growth!

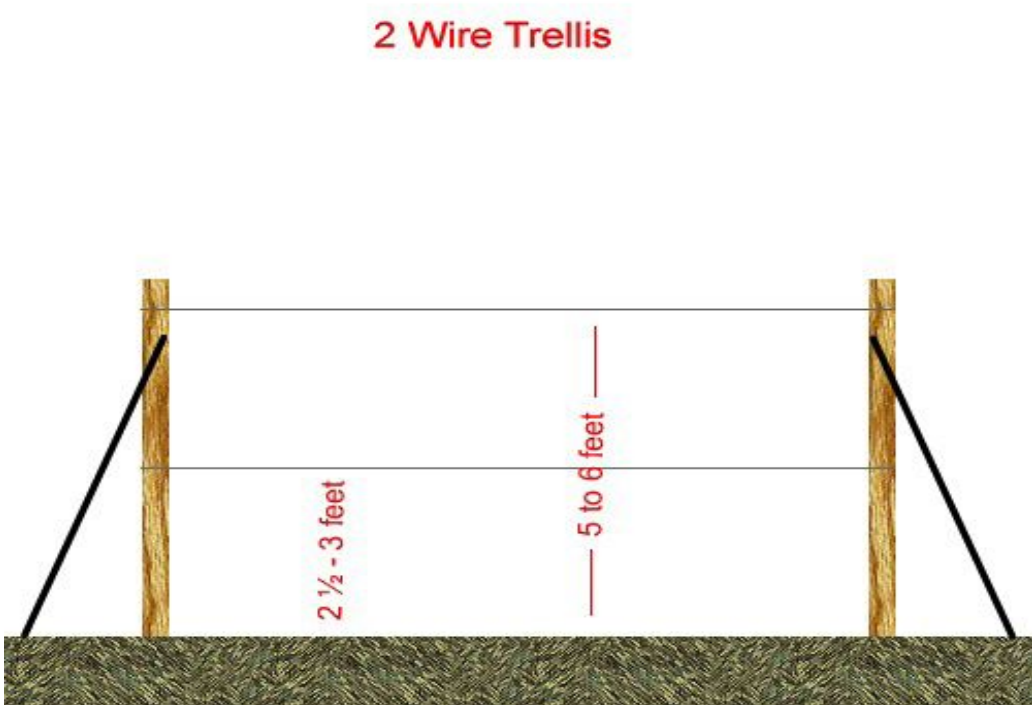
The real solution to the problem is constructing the trellis or arbor beforehand, before you even plant the grape vine. You should construct the support system during winter, so when the growing season starts in spring and the grape vine starts developing shoots, the support is already in place. This will ensure that you can train and evenly spread your grape vine's shoots on the trellis or arbor wires and minimize the time it takes for your grape vine to produce grapes!

Single and Two wire trellis

These two are the most common training systems available, but I personally would not recommend it for two reasons.

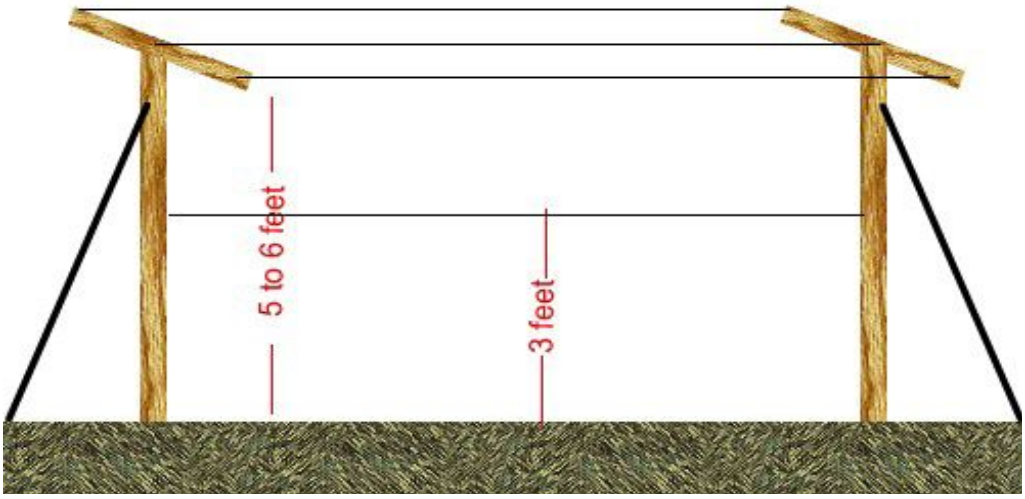
1. all the leaves, buds and fruit do not get enough exposure to the sun with these training systems and
2. the vines are usually so compact that you don't get any air flow (necessary for disease control).

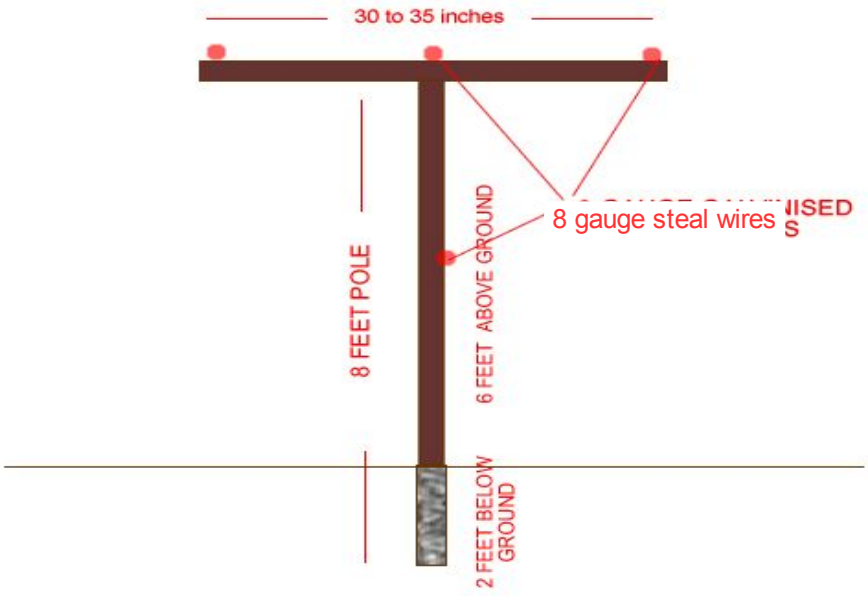
The single wire trellis looks exactly like the picture below, except that the wire at the bottom is missing. Training a grape vine on a fence looks the same as this trellis, except you can add more wires.



T-Trellis

This training system is widely used for wine grapes, or varieties that do not grow that vigorously. For most of the table grape varieties, this training system is not recommended. Table grapes normally grows more vigorous than wine grapes and can easily overgrow this trellis and cause the shoots to hang over the last wires of the trellis. This will prevent proper sunlight penetration and airflow.



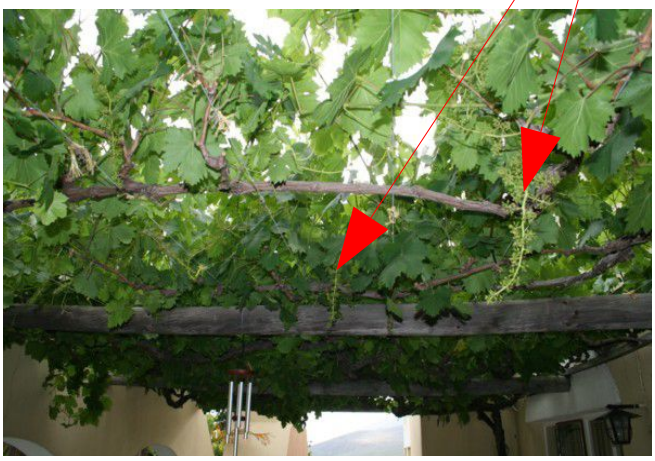


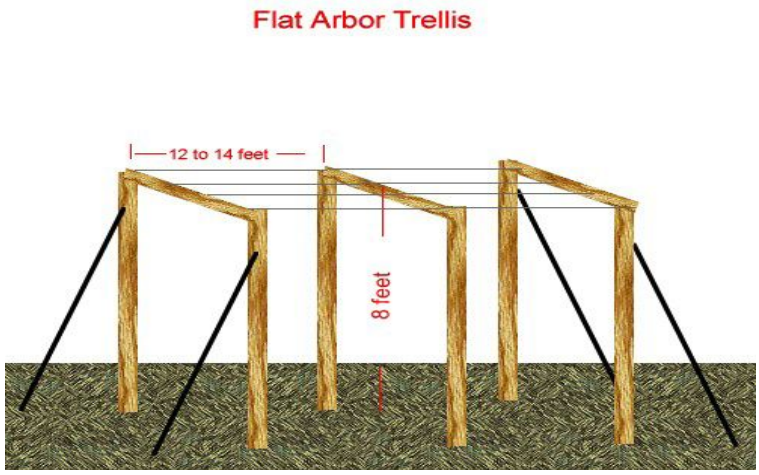
Flat Roof Trellis (Arbor)

This is lovely trellis system for your grape vine and it suits all grape varieties. The arbor expose the leaves and fruit to lots of sunshine and when the clusters get bigger, they will hang loose from the leaves, which will looks very beautiful and attractive. One negative thing about this trellis is that you will have to work with your hands above your head, when pruning, training and removing any leaves from the grape vine.

Use this trellis for your driveways, patios or footpaths; it looks lovely in summer! I use this trellis to cover my patio at my swimming pool. Look at the pictures to get some ideas that will work in your garden.

Here you can see the young grape clusters hanging loose from the leaves (nice, isn't it?)





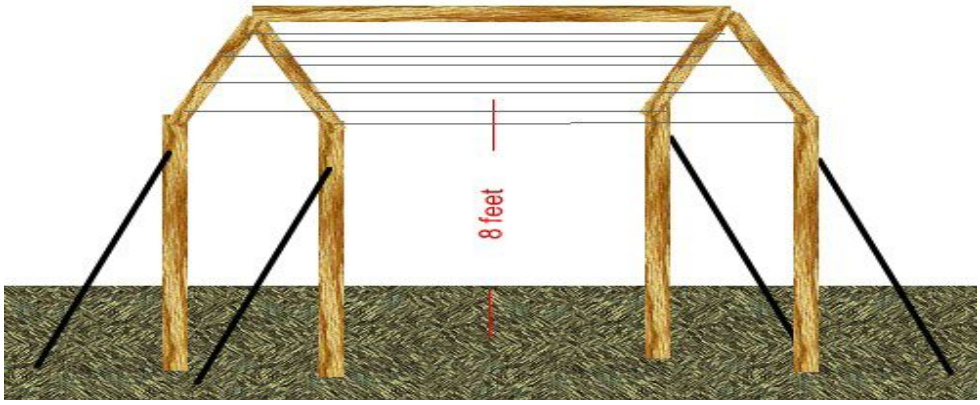
The gable or slanting trellis (as I call it)

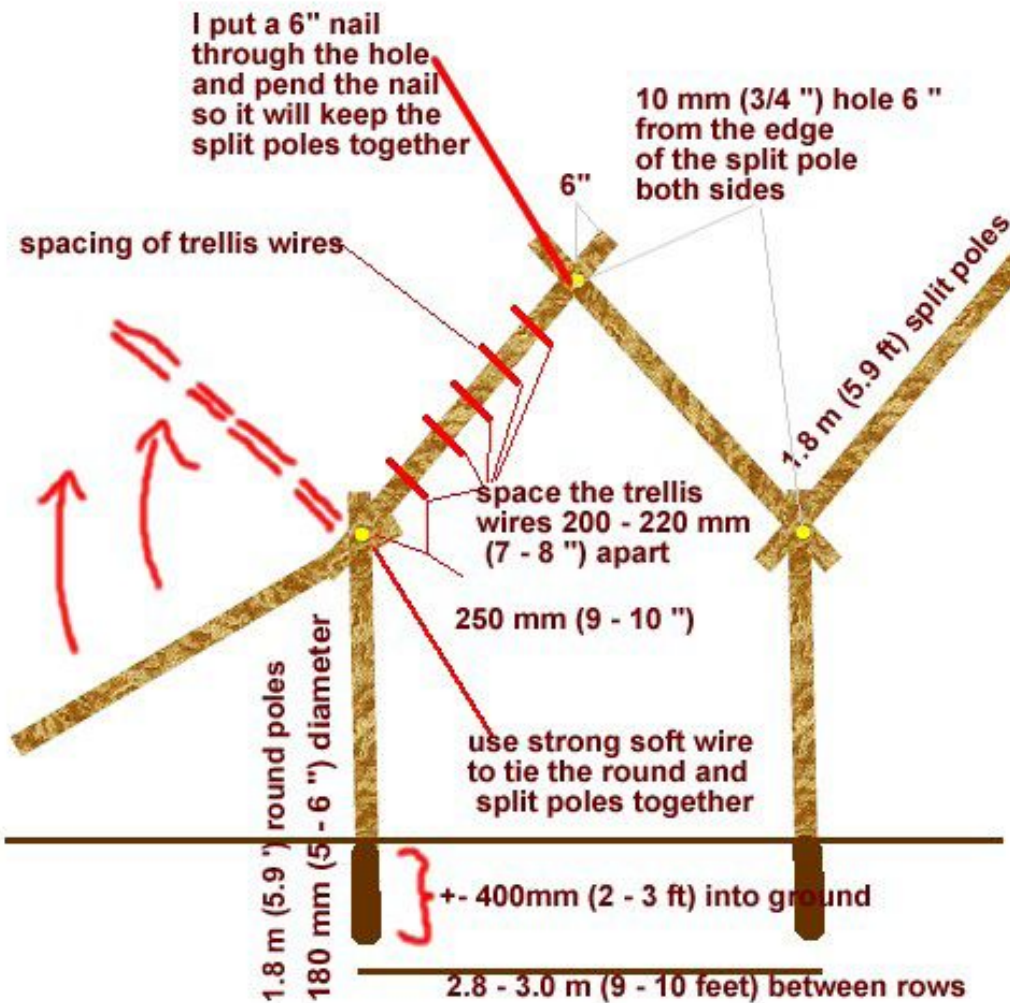
All of the +- 42 000 grape vines on my farm are planted this way and is one of the best trellises I've used. The grape vines on trellises like in the picture below, can produce about 30 to 34 clusters of grapes, all weighing +- 800 gr (28 ounces), every year! That gives you 25 kg (55 pounds) of grapes per year! Yes, that can be done!

Look at the picture and the drawing below:

A more vigorous canopy growth. Imagine your pathway underneath a canopy like this!!

Slanting Trellis



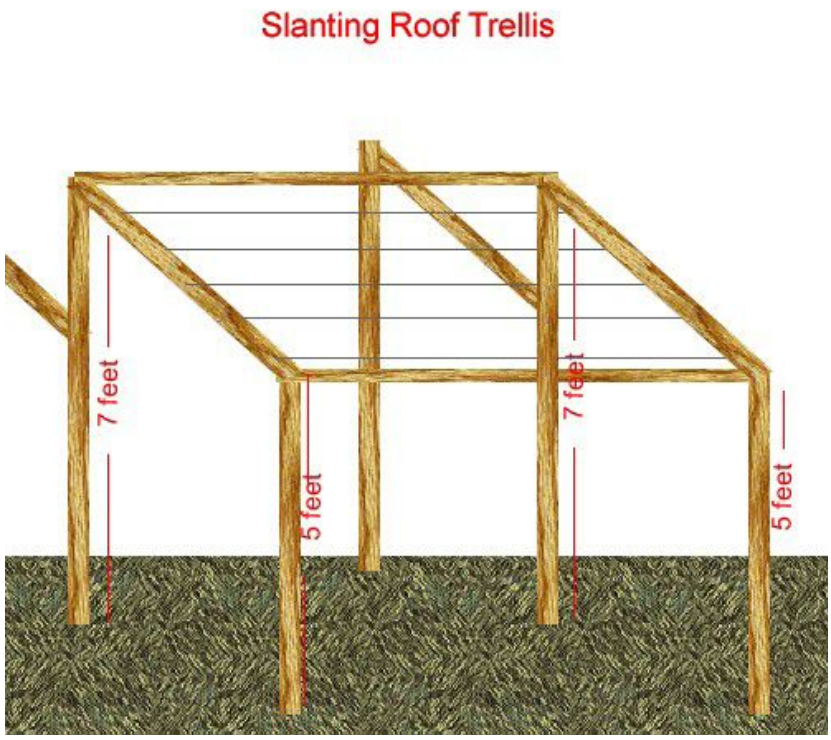


If you are a FULL member of the Grape Coaching Program, you can watch these view video clips and more info for constructing the Gable Trellis system by clicking here.

Not yet a FULL member? Sign up here.

The slanting roof trellis (as I call it)

I like this trellis as well, because it gives the leaves maximum sunlight exposure. Remember to face the slope of the trellis towards the direction of the sun. For the horizontal poles, you must use a 7 to 8 foot pole and space the wires about 8 inches apart.



Chapter 5
Preparing your soil and planting your grape vine:

It is generally preferable to root and grow grape cuttings for 1 year in a well-drained garden area or propagating bed before transplanting them to a permanent location. Prepare this area by tilling the soil and fertilizing it with a well-balanced fertilizer. Plant the cuttings 5 to 6 inches apart in rows 2 to 4 feet apart and let it settle here for a year.

No pruning is necessary while growing in the propagation bed. Just let the grape vine grow, as it likes. One thing you should do is to remove all grape clusters that might develop, at a very early stage. This will ensure that all the energy will go into growth, which the vine needs for developing a strong root system and canes. I know the temptation will be there to leave some of the clusters, but this will do more harm than good. These clusters will be of no value anyway, because the grape vine is too young to ripen the fruit properly.

Grape vines in a propagating bed (see how they grow like shrubs)

REMEMBER TO REMOVE THOSE CLUSTERS MY DEAR GRAPE GROWER!

At the beginning of fall, you will notice that the leaves of the young vine will turn a brown yellow color and will eventually dry out and fall off. Don't worry, this is normal, the grape vine is a deciduous plant. When the vine has lost all of its leaves, it means that the grape vine is now dormant. This is the time when the plant builds up energy for the growing season ahead. Normally, if your winters are wet and cold, the young grape vine needs no attention except if you get heavy snowfall. If so, cover the grape vine with something.

To access more information on preparing your soil, site location, row directions and more ...
Click on the following link. This is part of the free trial membership for the Grape Coaching Program! Enjoy!
Click here

At the start of spring, it is time to prepare the home of your new grape vine. It is advisable, but not crucial, to take a soil test before planting your grape vine to determine if the soil needs any lime and fertilizer. This is not an expensive test and but very helpful because this will be the home of your new grape vine for many years to come.

If your soil is infertile, it is necessary to fertilize the soil before planting the grape vine. Never fertilize the soil inside the plant hole, it will sear the young roots and can even kill the plant!

Choosing the right spot to plant your grape vine is crucial, for grape plants can survive for 50 to 100 years, provided you care for them properly. Thus, it is important to consider carefully both site selection and site preparation before you plant.

Not giving enough attention to soil preparation and plant location, will surely prevent your grape vine from becoming a grape production “machine”!

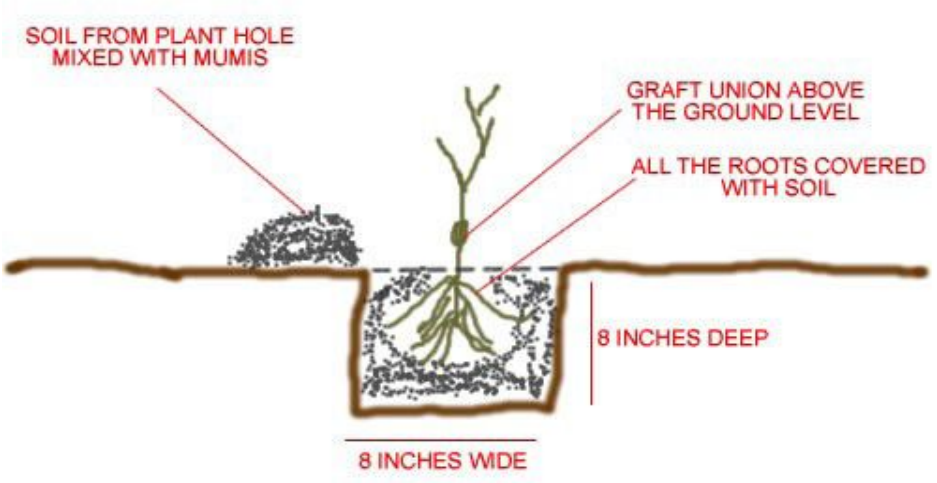
Choosing a sunny, frost free position is important, because grapes need lots of sunshine to ripen the fruit and is very susceptible for frost after shooting (early spring). If you plan to plant a row of vines, a north/south row direction is more suitable than an east/west direction, because the fruit and leaves will be better exposed to sunlight. If it is possible, choose a location with a slight slope, especially a southern or southwestern slope, because they generally have higher temperatures and are less likely to get frost.

A fully-grown grape vine has a huge root system that stretches for as long as 20 feet! Be sure to prepare your soil well by tilling an area of about 4 feet in diameter and at least 2 feet deep. Grape vines like a deep, well drained soil that is not too cold during the growing season. Avoid soils with impervious subsoil layers of clay, these soils normally have poor drainage and are not suitable for growing grapes, except if you can break these clay layers with some kind of mechanical preparation or tilling.

Make a hole (200 x 200 x 200mm) 8 x 8 x 8 inches and mix a hand full humus with the soil taken from the plant hole (do not put the humus in the bottom of the hole – mix it with the soil taken from the plant hole – do not overdo it, just add a hand full of humus to the soil!).

My-Grape-Vine.com
"The complete grape growers guide"
By Danie Wium
"The Grape Guy"

THE IDEAL PLANT HOLE



Now that you have prepared your site and you are sure that your soil is fertile and ready to become the home of your new grape vine, it is time to take the cuttings (not really cuttings anymore) from the propagation bed. Use only those cuttings that have grown strong enough during the previous season. Some of the cuttings may have died as well, but you will be able to tell which is perfect for replanting.

DO NOT CUT THE ROOTS OF THE VINES

Try not to disturb or remove the soil around the roots when you take them out of the propagation bed! Plant these cuttings immediately, and do not let the roots dry out, no matter what!
Put the young grape vine in the hole you have made, cover all the roots with soil and firm the soil well around roots to remove air pockets, and water thoroughly. Leave a slight depression around the base of the plant to make watering easier. Make sure you apply enough water so that the whole root system is wet.

If you are using a grafted vine, plant the grape vine, with the graft union above ground level.
This is very important, because when you cover the graft union with soil, roots will grow from the graft union and the resistibility of the rootstock will have no effect anymore. Now is the time for your first pruning lesson, which I will cover in the next section.

PS: If you live in a cold area, you may cover the cuttings with mulch to protect it from heavy frost; carefully remove this material to expose the top two buds once the danger of frost has passed.

DO NOT LET THE GRAPE VINE DRY OUT AT THIS STAGE!

Replanting or Relocating a grape vine

The reason why so many new grape growers replant their grape vines, is poor planning, incorrect soil preparation and choosing the incorrect site or spot to plant their grape vines. Choosing the correct site location for your vineyard, is one of the most important choices you as a new grape grower have to make as this will be the future home for your grape vines in years to come.

Let's get something straight; replanting a grape vine is not ideal, especially if it is older than two years. Therefore you need to do proper planning before you establish your vineyard.

So, your grape vines were not planted in the right spot or you are moving to another house and wants to take your grape vine with you – now what?

Transplanting a grape vine pose some risk, there is no doubt about that, but it can be done if you follow the instructions I am going to give to you now. Do not deviate from this too much as you could loose your grape vine.

The first problem with transplanting an old grape vine (2 years and older), is that the root system and structure of the vine gets bigger each year and makes the removal of the vine much harder. When transplanting these grape vines, you will eventually damage some roots, as it is impossible to take them out of the soil intact. Damaging the roots of the vines will result in the lost of moisture through the wounds and could result in the roots drying out too much and die. When taking the vines out of the soil, make sure you dig up as many of the roots as possible – the more roots you can save, the more successfully you will replant your grape vines.

The second problem with replanting a grape vine, is the loss of water through the leaves (evaporation). After replanting the grape vine, the roots of the vines are in a state of shock and for a week or two will not be able to take up water from the soil. If the climate is hot, the grape vine will loose water through the leaves which will result in too little water in the vine and the leaves will start to wither.

You therefore need to minimize the apical growth in order to ensure there is enough available water in the vine itself by reducing the number of shoots to a maximum of three. I would recommend you prune back hard and leave only one strong cane from the base of the lowest cordon. You can develop the new structure of the vine from there. Rather loose one or two year's growth and have healthy vine, than trying to retain the old structure and have a dead vine!.

The third problem is planting and watering the vine. Because you have a much bigger root system than a normal rooted cutting, you will have to make a much bigger planting hole. Make the planting hole large enough to accommodate ALL the roots and do not prune back any roots to fit the planting hole – rather make the hole larger.

It is important that you understand, that these vines needs allot of water the first few weeks (as explained before). After removing the vine from it's old position, place the roots of the vines in a bucket of water for at least six hours, prior to planting it in the new location. This will ensure the roots stay moist and the vine will not loose any water through the wounds on the roots.

Do not put any fertilizer in the planting hole it will damage the roots.

I have successfully transplanted 5-year-old vines this way, and there should not be any reason you cannot do it yourself, but it is always better to avoid replanting a mature vine.

I hope this gave you more insight on how to relocate a mature vine – the key is:

- Keep as many of the roots as possible,
- Minimize apical growth for at least a month
- Make a large enough planting hole
- Keep the vine well watered.

Dormancy of the grape vine

Dormancy of the grape vine is often misunderstood as it is not a single process, but 3 different processes all together. Each one of these many factors influenced processes.

The three dormancy stages.

1. Summer rest

Yes, there is something like summer rest. From the time the buds were formed until fall, many buds that don't sprout, are in what we call summer rest, and because of the presence of grapes, leaves and growing points, these buds will not shoot or sprout. To proof this, you will notice that after a vine is hale damaged or a heavy top action, these buds starts to shoot. In some hot subtropical and tropical areas, only a small prune wound is enough to let the vine break out of dormancy and it will start to shoot, if the winter temperatures in these areas are high enough, a second yield can be harvested!

2. Winter rest

After the first cold nights during fall, the vine will go into what we call winter rest. This is a deep state of dormancy. Experiments on vines revealed that the artificial breaking of this dormancy would result in a very uneven shoot of the buds.

3. Normal rest

During normal rest, the vine has come out of winter rest because of the rise of the average temperature when spring is about a month away. Many grape growers will artificially break the rest period of the vine with a RBA chemical. Earlier and more even sprouting occurs, and harvest time will most of the times be a week or even two weeks earlier.

In the tropical, hot areas of the world, the grape vine seldom goes dormant as the temperatures are too high, these areas can produce two crops per year, but special care must be taken to feeding and watering the vine.

Where the winters are cold, it is normal for a grape vine to loose it's leaves and many newbie home grape growers, think there is something wrong with the vine or the vine is dying. The vine losing it's leaves, is preparing to go into dormancy and this is when energy is accumulated for next year's growing season. Applying a light N fertilizer during this stage has many advantages, as the roots of the vine are still active. This N is stored in the roots, canes and framework of the vine. When spring arises, the vines use this N to sprout. Little to no watering is needed during dormancy, depending on how dry the winter are. If you live in an area where no rain occurs during winter, you can water the vine once every two to three weeks.

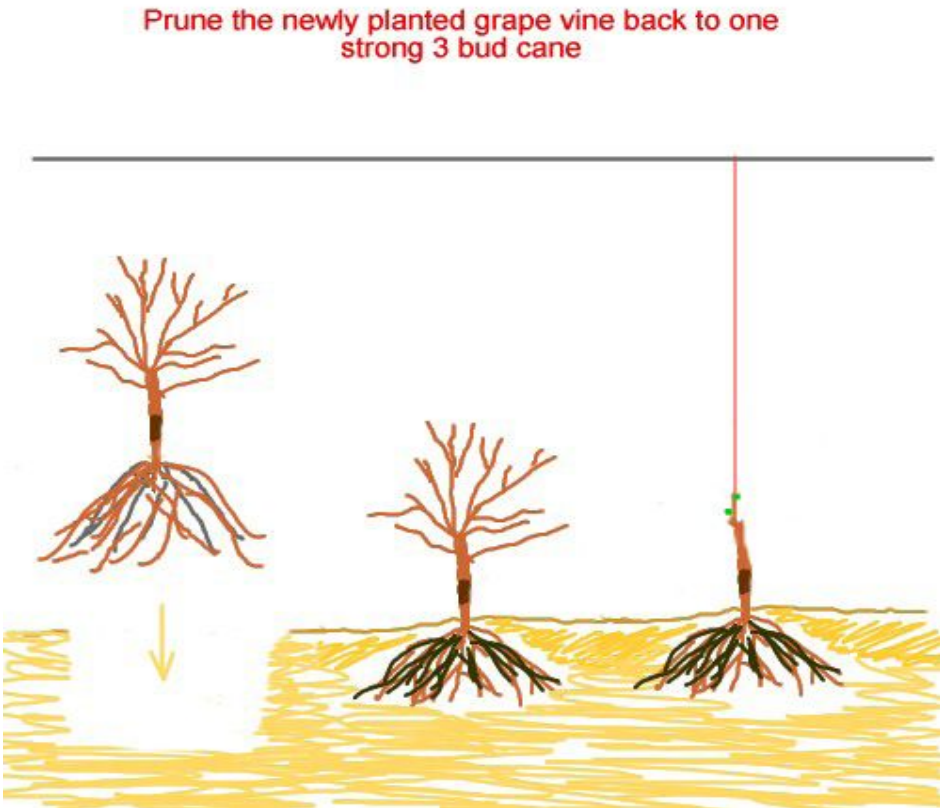
If heavy frost and snow isn't a big factor where you live, you can prune the vine during winter rest, otherwise, prune the vine during normal rest or as close to spring as possible (to reduce the chance of frost damage to young shoots).

If your grafted grape vines or cuttings are dormant, you should plant them when dormancy ends, because this is when root activity starts and the vine will come "alive" again.

Chapter 6
The first year of training your grape vine

OK, so now you have planted your first grape vine! Congratulations! Follow the instructions in this section very closely, as this will ensure the future of your grape vine!

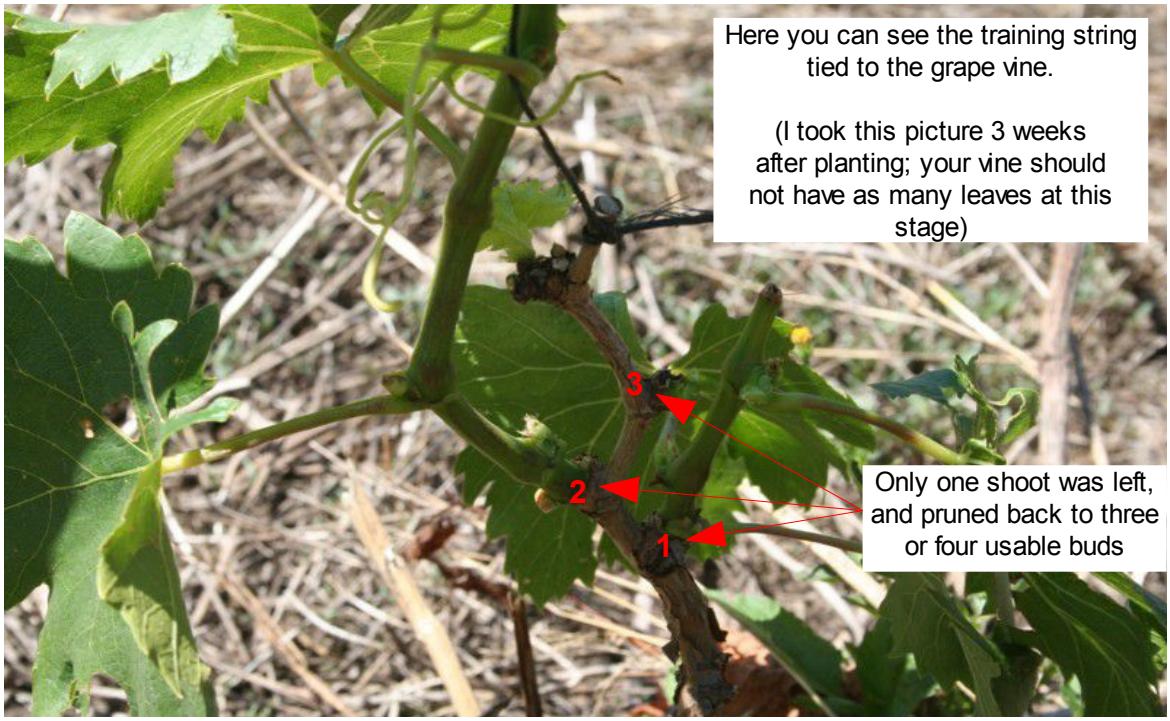
Your grape vine should look something like this:



After you have planted the grape vine, you will have to remove all of the previous year's shoots, except for one strong cane that is facing straight up. Cut this cane through the fourth but.

The reason we do this, is so that when you tie and stretch the training string to the vine, it will not slip off.

(On the next page I will show you how this is done)



Another reason we cut the cane through the fourth bud is to make sure that this bud will not grow and the string will not strangle the main stem after it grows thicker. To be sure, that this will not happen, remove the rest of the bud with your fingernails.

ALLWAYS BE AWARE OF THIS, BECAUSE I HAVE SEEN 2-YEAR-OLD GRAPE VINES STRANGLED BY THIS LITTLE PEASE OF STRING!!

Use a nylon string (weather resistant as it will support your vine for a full year!), and tie it around the stem of the chosen cane, BETWEEN the third and fourth bud (the one you have removed). Stretch the string and tie it to the bottom wire of your trellis.

At this stage, your grape vine will start to develop shoots. Do not let the vine dry out too much at this stage. One week after planting the vine, you can give a quarter of a teaspoon well balanced fertilizer. Sprinkle it around the stem of the vine, but *DO NOT* sprinkle it on the leaves or on the stem of the vine, it will sear the vine!

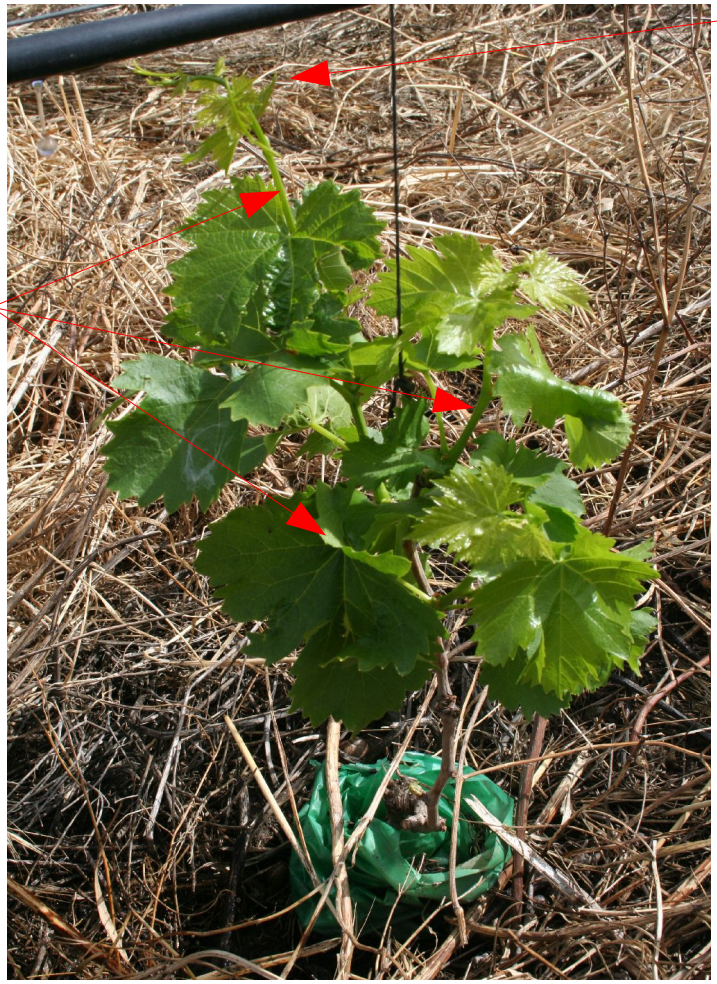
Leave the vine to grow, until the newly formed shoots are about 6 inches long. There should be 3 to 5 growing, but if there is only one or two, you can still start training your grape vine.

Now its time to choose the shoot that will one day be the trunk of your grape vine!

I hope you still following! Make sure you understand the following.

Choosing the correct shoot (training-shoot) is VERY important. This will be the trunk of your grape vine for the next couple of years. Look at the picture on the next page and see which one I have chosen to be the trunk of the grape vine.

Notice all the shoots that developed from the newly planted cutting.



Choose the strongest, shoot that grows straight up, so you don't have to bend it too much to twine it around the training string.

If for some reason the fourth bud made a shoot (that is the one above the training string), you must remove it at once and **do not use it as the training shoot!**

The "insurance" shoot!

From the picture below, you will notice a shoot that was pruned back to 3 buds. This is the "insurance shoot". You will have to remove all the shoots from the cutting, except for the training shoot and the "insurance shoot". We will keep this shoot, just in case the training shoot get damaged or break off. We will remove it later on in the growing season.

"Insurance shoot" Prune back the insurance shoot to about 3 inches or 3 to 4 buds and remove any lateral shoots from the insurance shoot.

Notice how I have twisted the training-shoot around the training-string. Now, you are well on your way training this youngster to become a "monster"!

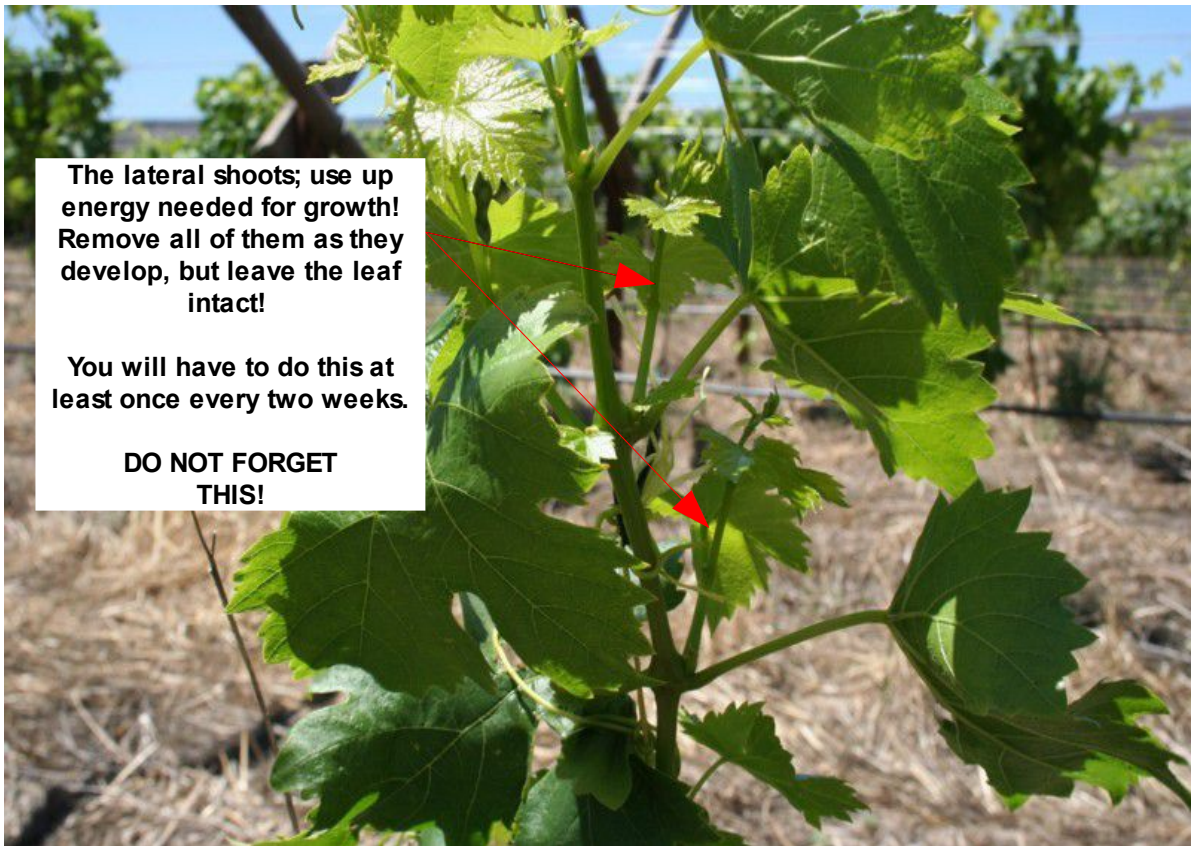
At this time, the grape vine needs as much energy as possible to grow and to develop more roots. Remove all the clusters as they become visible (do not worry if you don't see any clusters, they will be there one day!). Sadly, you will have no harvest this year, but to ensure next years' harvest you will have to do this.

As time goes by, you will notice that little shoots start developing between the leaf stalk and the training-shoot (side shoots or lateral shoots). Look at the pictures below and remove them by breaking them off, except for the top two, as they develop. This will ensure that all the energy goes to the main growth-point (situated on the very tip of the training-shoot).

Before removing shoots

After removing shoots

Removing lateral shoots



Remember to twine the training shoot whenever it comes lose or has grown in length. Be careful not to break/hurt the growing-point. If somehow, the growing point breaks off, do not panic, as we have left the top two lateral shoots remember? This will become your new main growing-point! :-)

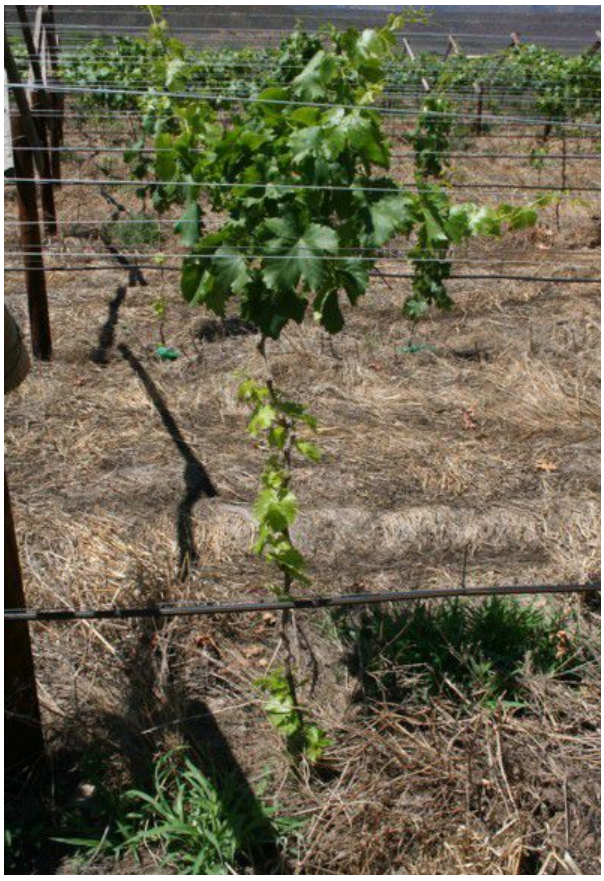
When your vine reach the bottom trellis wire

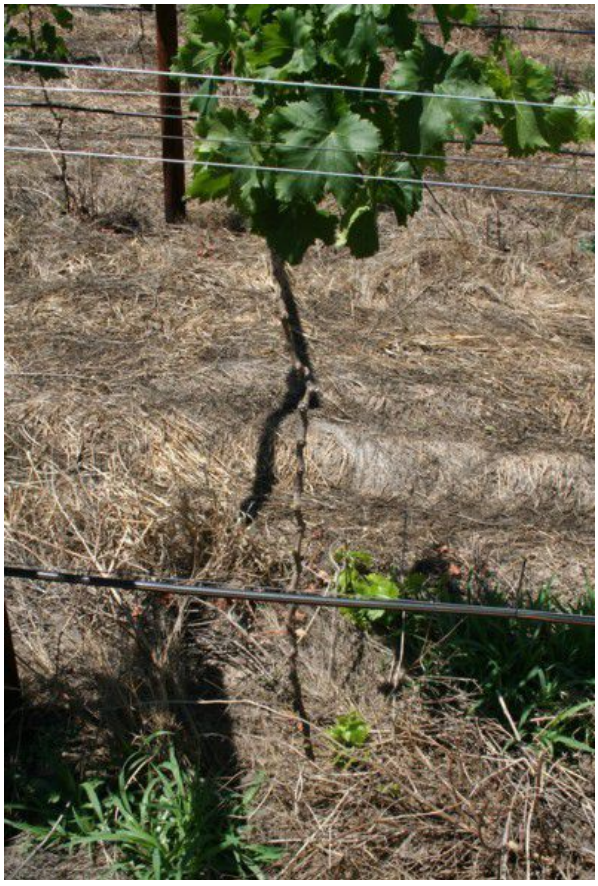
Repeat the above process until the grape vine reach about 6 inches from the bottom wire of your trellis. Now you will have to **stop removing any lateral shoots that develop within 6 inches from wire** of the trellis. We will use these lateral shoots to devolop the framework of the grape vine. I will show you how to do that, later.

This vine has almost reached the bottom wire of the trellis.
From now on, I will stop removing
any lateral shoots that develop 6 inches from the wire.
Notice there are no lateral shoots visible on the vine at this stage.

Do not stop removing the bottom lateral shoots that will develop again and

REMEMBER TO LEAVE THE LATERAL SHOOTS - 6 INCHES FROM THE WIRE!



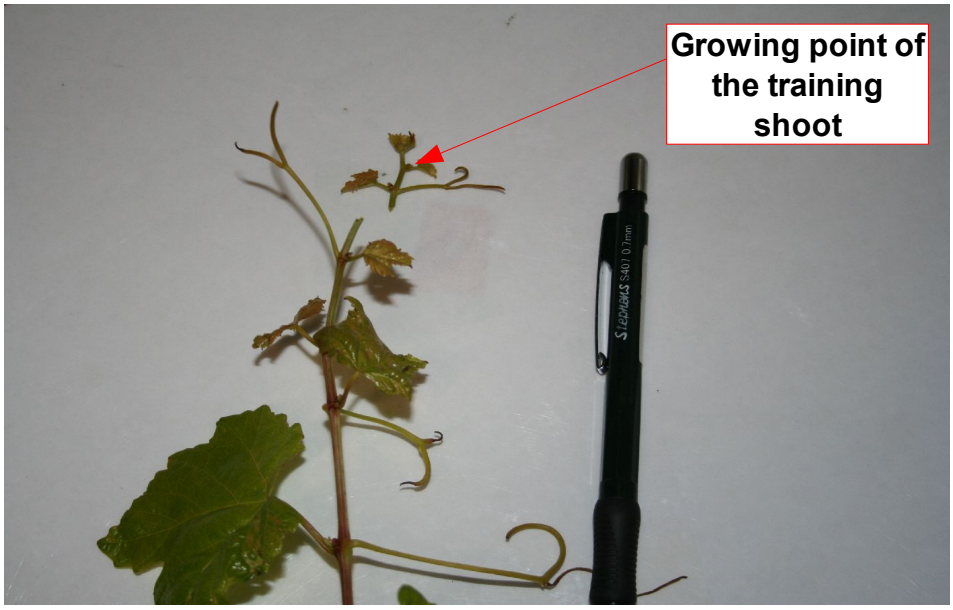


Water your vine, but not too much! Water once a week if your climate is cool, and 2 to 3 times a week if your daily temperature is higher than 25 ˚C or 77 ˚F. Apply some fertilizer every two weeks, as explained before (do not fertilize too much – quarter of a teaspoon is more than enough).

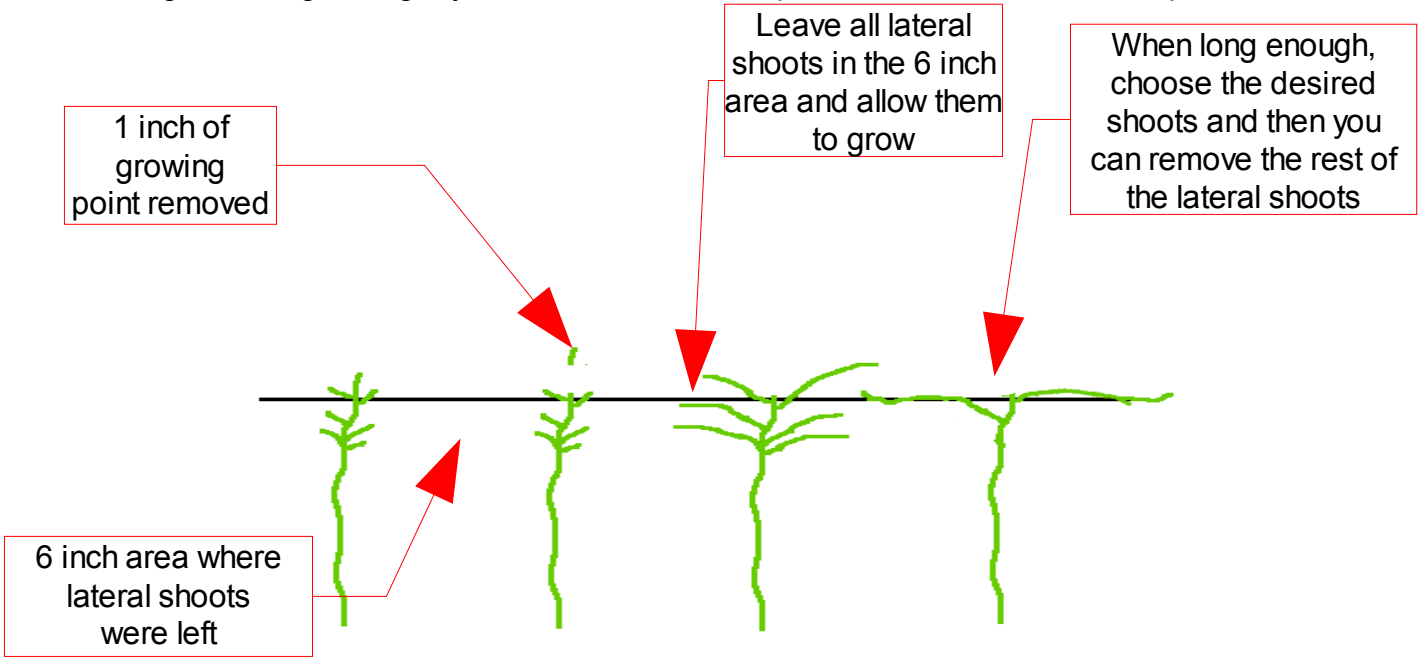
Let's talk about splitting a shoot.

Some trellis systems or training systems require the vine to grow in opposite directions, so you will have to split the vine to grow in these directions.

When your vine reached the trellis wire where you want to split the shoot and build the framework of your vine, you will have to remove about an inch of the growing point of the training shoot.



This will ensure that the lateral shoots (within the 6-inch area) grow much faster. When these lateral shoots have grown long enough, you can choose the required shoots to start develop the framework.



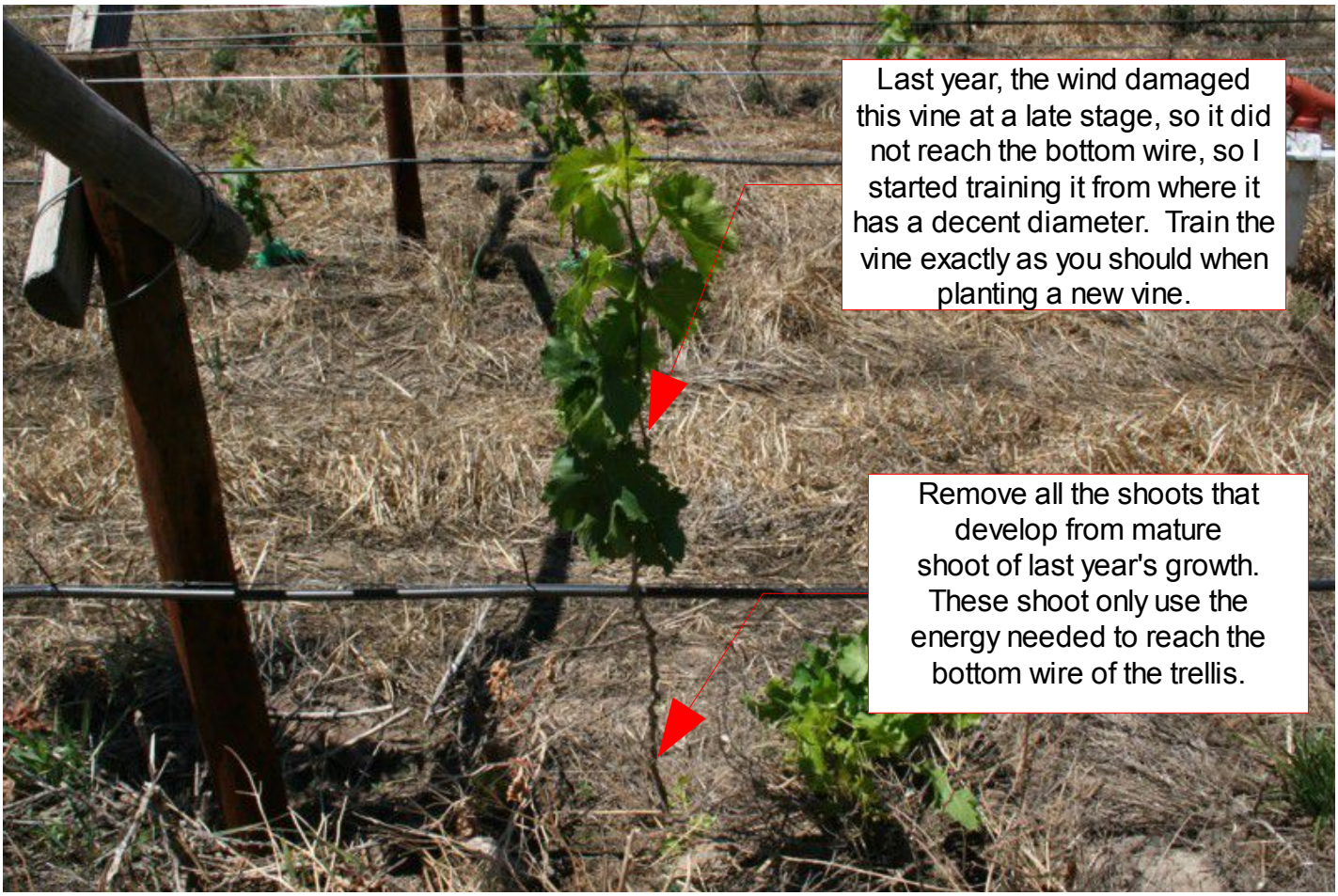
Well done, your grape vine has reached the bottom wire of the trellis!

WOW!

Depending on many things, you should be well into summer by now. Remember, even I as an expert grape grower, do not always succeed in getting all my newly planted grape vines to reach the trellis wires in the first year; this should be your objective. If this is the case, I recommend the following method for next season.

Look at the picture below. The vine was damaged by the wind last year, so I started training it again about halfway between the ground and the bottom trellis wire. During winter I pruned the vine back to the last bud, where you can see that the cane is strong enough. Remove the rest of that bud and stretch a new training string between the vine and the bottom wire of the trellis. Use exactly the same principles as you should have, when you started training a newly planted grape vine.

One difference though, next year, it will reach the trellis wire in no time, because it has a well developed root system and a shorter distance to grow. Some growers prefer to cut these vines back to 3 buds, and start all over again, but I rarely do this, except when a vine is very weak comparing to the others in the same vineyard. Normally I will replace very weak vines with new ones.



A well looked after grape vine should not have any problems reaching at least the bottom wire of the trellis. If that is the case with your grape vine, I must congratulate you, because you have succeeded in your first year's goal!

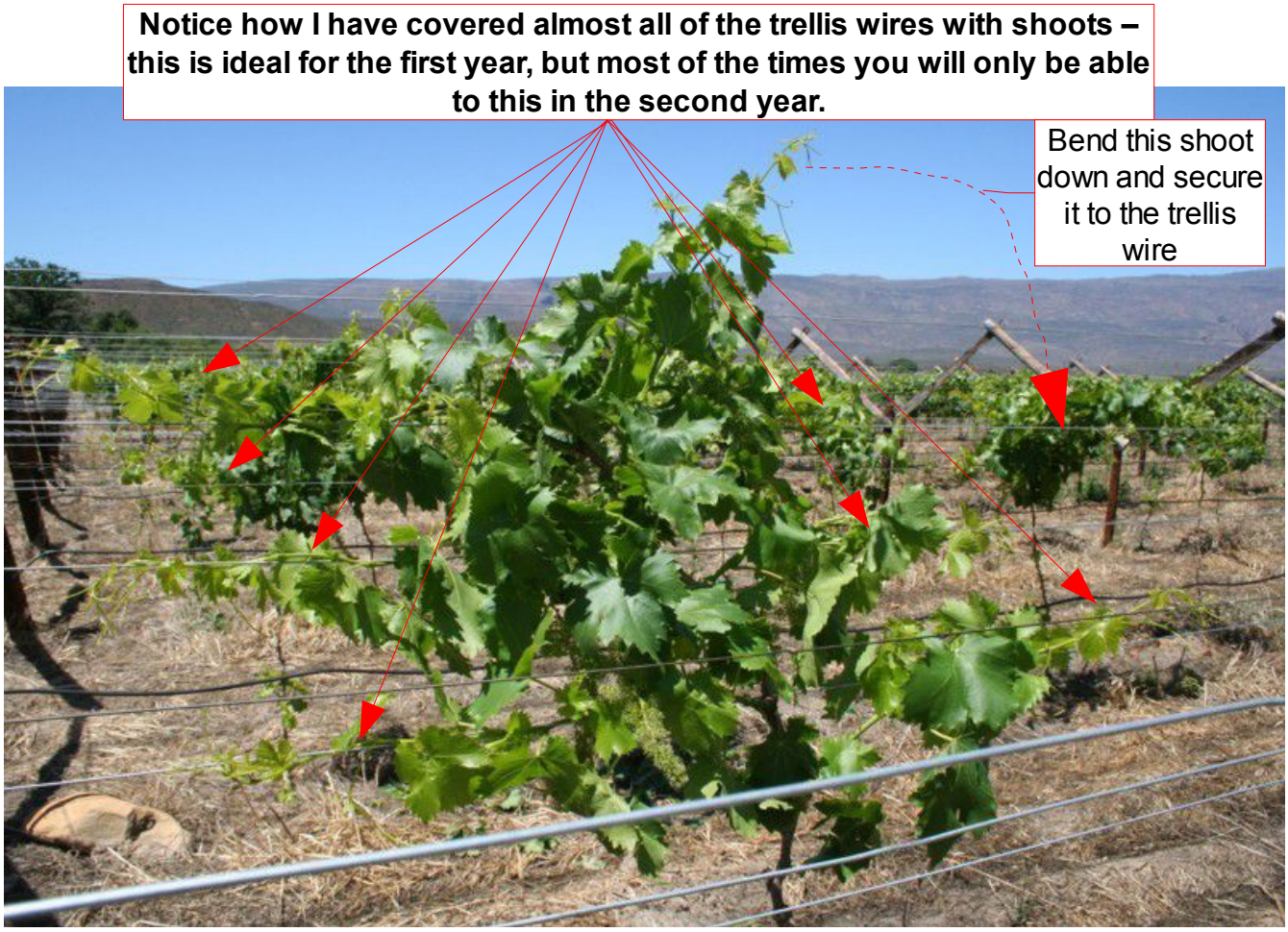
Well done!

Remember to remove all of the grape clusters and use the energy to grow your vine!

If your vine grows beyond the bottom wire, that is even better! All you have to do is to twine all of the shoots and lateral shoots to the trellis wires. - remember, you didn't remove laterals that developed in the 6 inch zone, this is where we will use them!. Try to cover as many wires on your trellis as possible and spread the growth of the vine evenly to the left and the right of the training shoot.

You can now remove the training string, which guided your vine to the bottom wire. You can also remove the insurance shoot now.

Look at this picture. It does not matter what trellis system you use, just as long as you try to cover as many of the wires as possible. By doing this, it will be easy to create the framework once you start pruning in winter.



It sometimes happens that the main shoot (training shoot) grows so vigorously and pass the top wire of the trellis, without the lateral shoots developing on the training shoot. If this is the case with your grape vine, you will have to take out the growing point of the main shoot (training shoot) with your fingertips, when it reaches the second last wire of your trellis.

The reason we do this, is so that the vine can translocate all of the energy into the growing points of the lateral shoots (remember, they also have growing points), and they will develop much faster. You need those lateral shoots to develop the permanent framework of your grape vine.

Do not worry about the main shoot; a new growing point will develop again – TRUST ME :-)

Chapter 7
Pruning your grape vine the first year.

Let nature take control of your vine during the winter. It will go dormant and loose all of its leaves. You will only have to water the vine if you have very dry winters, otherwise no watering is necessary. About a month before spring, it is time to prune your grape vine. If it still very cold where you live, or early spring frost is a problem in your area, do not prune yet, you can prune when spring is on hand (as soon as you see that the buds on the grape vine starts to swell).

Your dormant grape vine should look something like this:

You need to remove all of the shoots that developed during the summer, **except** for the strongest, straightest one on the vine. If your trellis has 5 wires, cut this main shoot through the nearest bud above the **4th** wire of the trellis (see picture below). Tie it to the wire with a string.

If your vine didn't reach any wire except the bottom one, then cut this cane to **one** bud above the bottom wire and tie it with a string to the wire.

We will train it from here in the upcoming growing season. Remember to cut it **THROUGH** the nearest bud above the wire and to remove what is left of that bud with your fingernails.

After pruning the vine, it should look like this.

Simply take the pruned canes and tie them to the second last trellis wires after you have pruned it. This vine was not strong enough to have any canes for the frame work, so I have removed them all and left only two canes. From here, new shoots will develop that can be used to construct the framework

If your vine didn't reach the bottom wire, cut it through the last bud where the shoot has a reasonable diameter (as thick as a normal pencil), and start training it from there next season. Look at the picture where the wind damaged one of my vines; this will give you a good idea on how to train it from here.

Here are 2 pictures of a grape vine that didn't reach the bottom wire of the trellis. Notice how I pruned it back through a strong bud and tied it to the bottom wire of the trellis. Remember to remove the bud where you tied the string and if a shoot develop from this bud, remove it at once and do not use it as a training shoot.

Only, and only, when your grape vine looks something like the picture where I covered all of the wires with shoots) during the previous growing season, then you can consider developing the framework of the vine in the first year. Remember, you will probably not get growth like that in the first year except if you have got really green fingers :-) .

If your vine doesn't look like that, then you MUST remove all the lateral canes – do not make the mistake I see so many grape growers do, trying to develop the whole frame work of the vine in the first year. If you try to develop the framework of a grape vine with subordinate side shoots, you will fail to create a strong framework. I promise you it will set you back later on.

When pruning the lateral shoots, make sure you do not hurt the buds where the side shoot and main shoot joins, because this is where the shoots in the growing season will develop. You need to make sure you understand what I am trying to explain here, before you move on to the next section of this book.

Developing the frame work and arms (cordons) of your grape vine

We have reached the part of this e-book, where you will have to choose which of the following training methods suits you. Your grape vine reached the trellis or arbor last year, and now you will start to create the cordons or framework of your vine. This is an important section of your training, because now you create the permanent shape of your vine. Your aim will be to cover the whole area of the trellis and to spread the shoots on every wire of the trellis.

A well-formed framework will make your pruning, removing of leaves, water shoots and manipulation the clusters, much easier. It will also ensure good sunlight exposure to all the fruit, shoots, buds, bearers and leaves. By this time, you've probably noticed that I have mentioned exposure to sunlight quite a few times, and I will mention it again further on in this e-book because it is very important.

There are so many training systems and different ways to trellis your vine, that I will give you the basics of creating the framework of your vine and you can decide how to apply these basics yourself. Be creative, but do not deviate too much.

You can email me at grapes@my-grape-vine.com, if you have a specific way you want to train your vine, and you are not sure how to go about, but I am sure you will be able to train your vine yourself, after you have completed this section. Your trellis or arbor, will mainly determine which method of training you will use.

Secondly, your variety will determine if you will have long bearers (cane pruning) or short bearers (spur pruning). If you don't know which variety you have, don't worry as I will show you how to adopt a middle course in order to find out if your grape vine is fruitful enough or not.

Chapter 8
The second growing season

Your grape vine will start to show life after a few hot days in spring. A sigh of relief! Your grape vine is still alive :-) First the buds on the grape vine will swell and then reveal some hairy looking scale leaves.

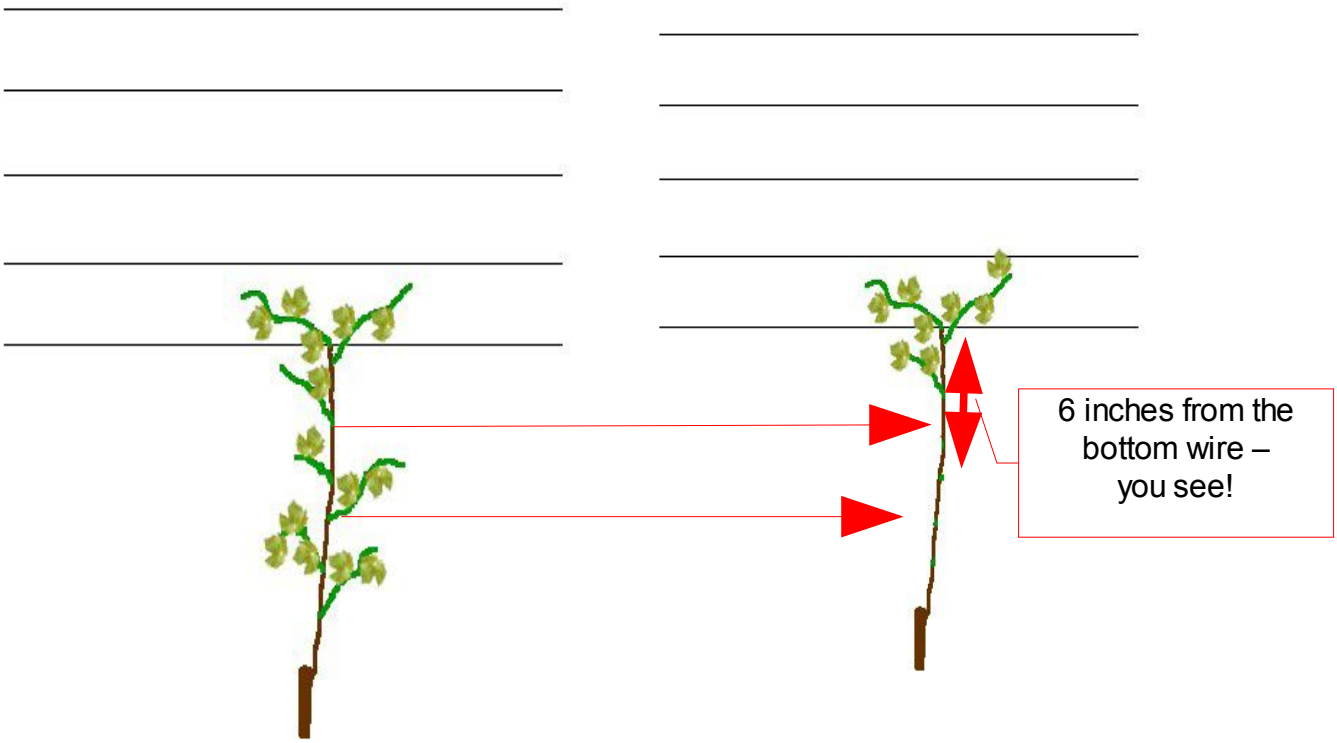
Because the cane you pruned to the trellis wire is all one-year-old wood, all (or should I say most) of the buds will start to open up.
Soon, the whole cane will be covered with small leaves developing from the buds of the grape vine.

If your grape vine only reached the bottom wire of the trellis, it should look something like the following picture.

During the first signs of bud break, it is important to remember that the buds break on nutrients that was stored in the canes, stems and roots of the vine and NOT from nutrients taken from the soil.

As soon as the new shoots reach a length of about 2 inches, the vines start taking up nutrients from the soil. This is the time to start fertilizing and watering the vine again. Remember the root system is now larger than the previous year, so you need to give a teaspoon of well balanced fertilizer, sprinkled around the stem of the vine, and water the vine one and a halve times the water of the previous season. Again twice a week dryer conditions or once a week in wet conditions.

Soon your vine will look like the picture below. Note that I have removed the shoots from the main stem of the vine up until 6 inches from the bottom wire, just like the previous year.



Stretch another string from the bottom wire to the second last wire on your trellis. It does not matter what kind of trellis you are using, this is only to support the main shoot

The string stretched to the second last wire of the trellis

The first grapes visible! This year you will have some grapes to eat!

Yes, the first grapes are visible! However, your vine is still very young so do not expect to feed the whole neighborhood!

Anyway, let the vine grow at free will, and keep removing shoots that develop on the stem of the vine below the 6 inches. When the first lateral shoots on the trellis are long enough to twine, you can go ahead and do so. I recommend doing this during the hottest time of the day, because the shoots are more flexible then. BECAREFULL NOT TO BREAK THEM!

Your main goal for the 2nd growing season is to cover all of the trellis wires. If you can achieve this, you have done extremely well!

Remember, to keep watering every week and fertilize every two weeks and don't forget; A weed free vine is a happy vine! So get rid of all the weeds around the stem of the vine.

Take a look at the picture above, you will notice 5 grape clusters (red circles) on this vine. There were about 12 clusters on the vine, but I removed 7 of them. Notice how I've tried to keep them as close as possible to middle of the vine, so they will not get sunburn from direct sunlight (the temperatures can rise up to 40 °C or 104 °F here in South Africa!).

Why do I remove clusters? Because your vine is not strong enough to fully ripen 12 clusters of grapes. Do not keep too many clusters on a young vine; it will only prevent you from covering the whole trellis area (Your goal remember!) Your vine needs 8 to 12 mature leaves on a shoot, to ripen one cluster of grapes!

A picture of a mature Sultana leave (enormous) – that black thing is a normal cigarette lighter.

Keep on looking after the vine, twine the side shoots on the trellis wires and remove the shoots at the bottom of the main stem – these are the most important things you will do during this growing season.

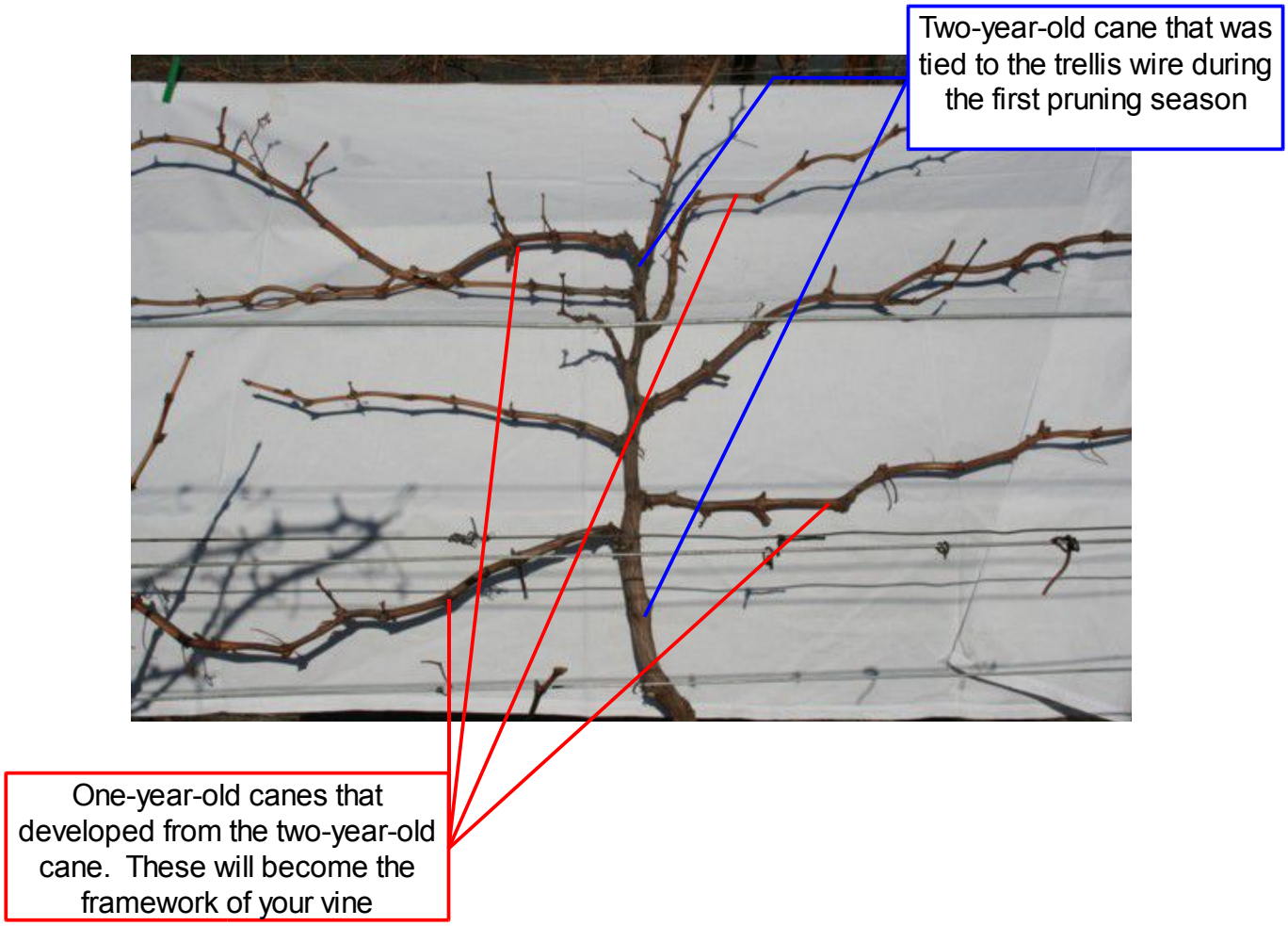
Somewhere along the line, your clusters will start blooming, cell division will take place and the berries will start to grow in size. Later on in this e-book, I will teach you how to treat your grape clusters, to get optimum berry size, sugar and colour, but for now, let us stay focused on developing the framework of your grape vine.

When winter comes; your grape vine will become dormant again; now we will prune the vine and develop the permanent framework!

Chapter 9
Pruning your vine the second season

During the previous growing season, you should have covered almost all of the trellis wires. These shoots will loose all of its leaves and become woody, brown canes. If you look at the pictures , the one where you bend down the shoot, you will get a clear pictures of where these canes come from.

Your dormant vine should look something like this; maybe there are more dormant canes on your vine than on this picture, but the basic frame will be more or less the same.



Any way, what you want to do now, is to develop the new framework of the vine. This is the part where you will have to use your imagination. It is impossible for me to explain every single training system in this e-book, as I will type forever, and you will be out of your mind before next Christmas!

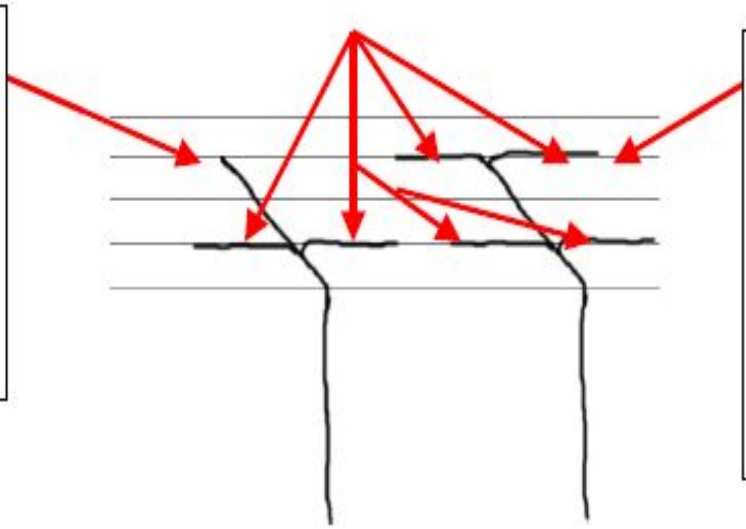
Look at this picture, print it out if you have to, then look at your vine, you will notice 2 year and 1-year-old wood. This is important, as a grape vine will only bear fruit on 1-year-old cane!

Always remember this, for it will always have to be your no.1 priority – choosing canes or bearers that will produce a crop!

I will show you some pictures to help you decide what to do.

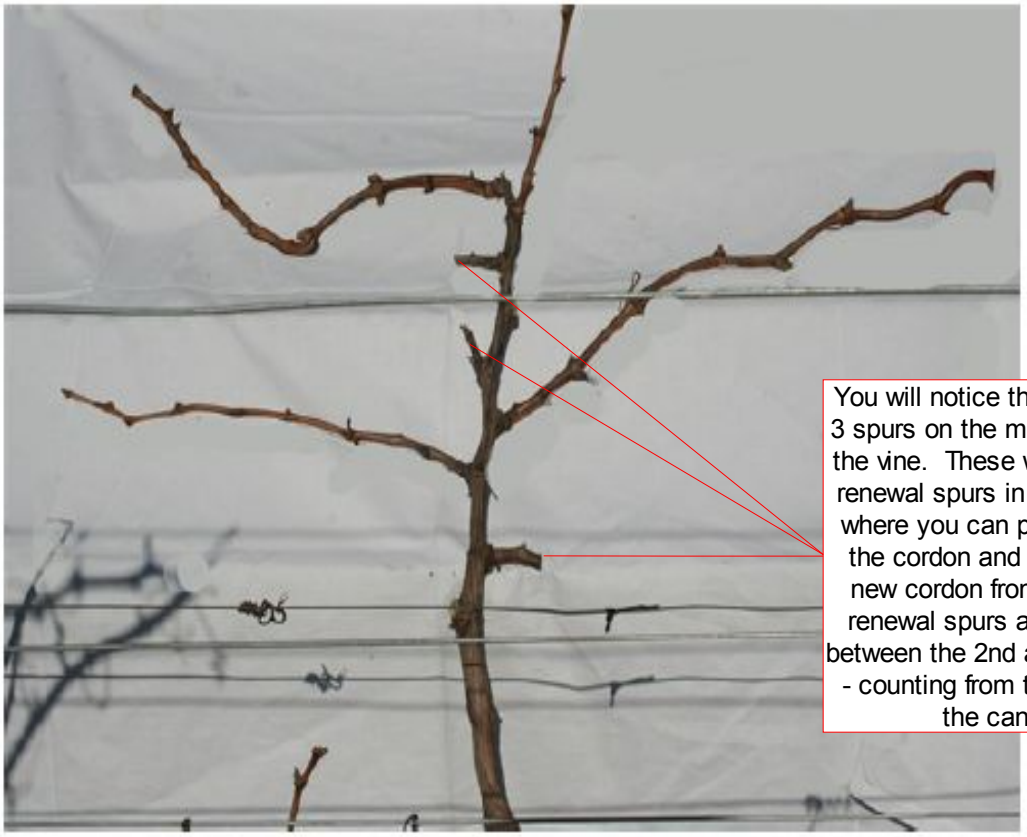
Make these shoots 7 buds long, and tie it to the trellis wire. Remove all the other shoots

It sometimes happens that the shoots for the top cordons of the frame isn't strong enough this year – remove them and prune like this



If the shoots at the top are strong enough, you can form these two cordons this year – remember, they must be strong enough, otherwise use the method on the left

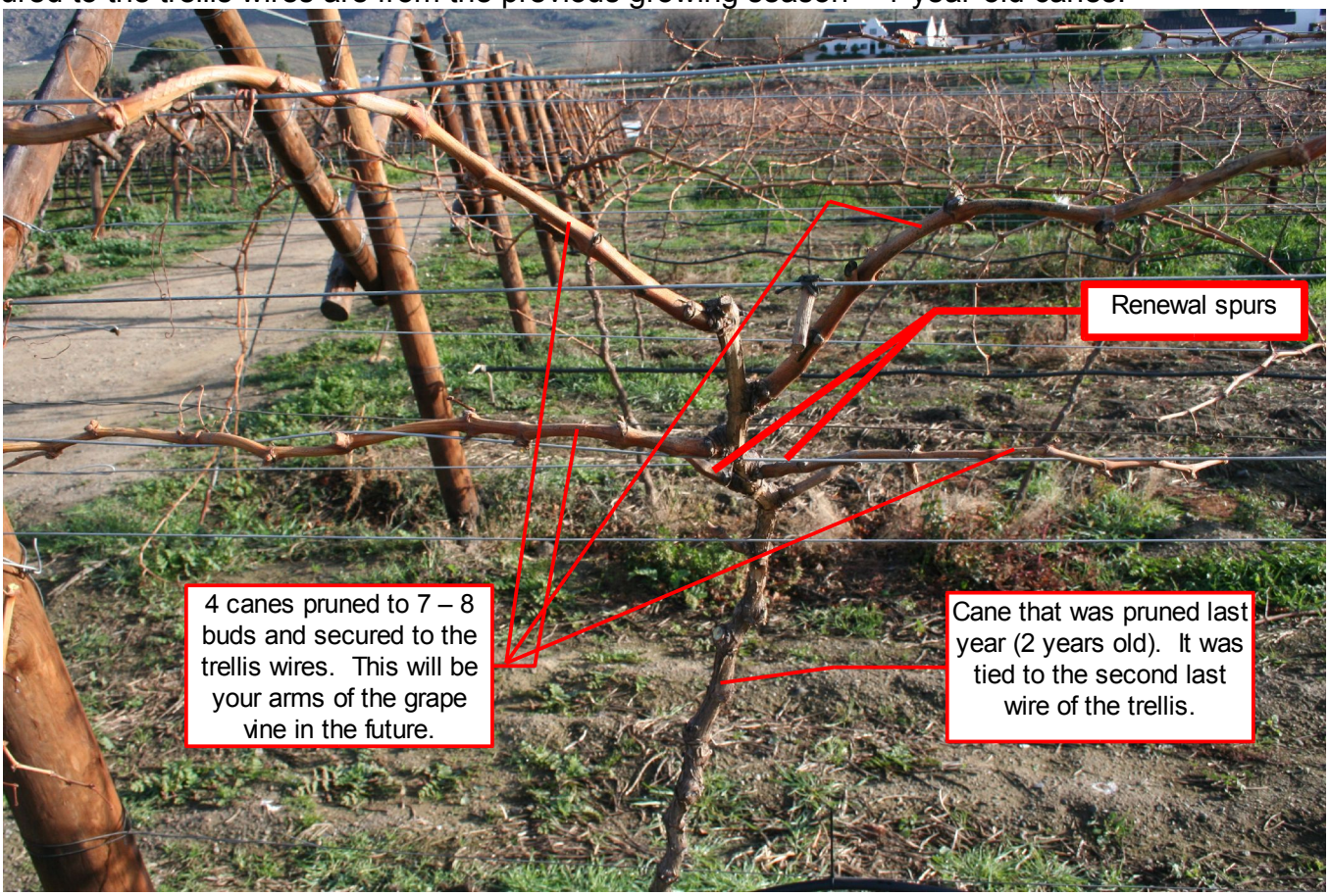
The same vine as the previous page – only after I pruned it,



You will notice that I pruned 3 spurs on the main stem of the vine. These will be your renewal spurs in the future, where you can prune back the cordon and develop a new cordon from. These renewal spurs are pruned between the 2nd and 3rd bud - counting from the base of the cane

Here is another picture after the vine was pruned and secured to the trellis wire.

Again, look at stem coming from the ground – this is a 2-year-old cane. The horizontal canes that was secured to the trellis wires are from the previous growing season – 1-year-old canes.



The renewal spurs in the pictures: These spurs I pruned on the main stem of the vine, is 1-year-old canes that was pruned between the 2nd and 3rd bud, counting from the base of the cane. These renewal spurs will develop shoots in the next growing season as well and may even bear some fruit, although this is not the primary reason why we prune them. The primary reason for having renewal spurs is to ensure shoots, close to the main stem of the vine, where we can prune back to if the arm or cordon of the vine becomes unfruitful or get damaged.

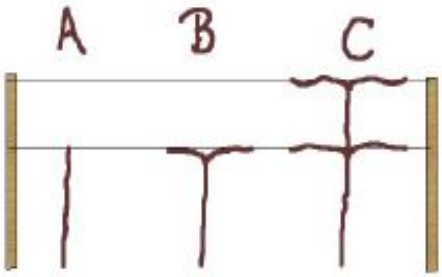
Although we have just pruned canes to the develop the arms, it a good practice to prune these renewal spurs as soon as possible. Sometimes and with some varieties, the grape vine will not easily develop shoots from the main stem after the arms have been developed – thus we prune them early.

These renewal spurs will be pruned back exactly the same way each year, until you decide to use it to create a new arm. Then you will again prune a 7 – 8 bud cane and start the new arm from scratch.

Make sure you understand the importance of pruning renewal spurs – this will make pruning in a couple of years much easier.

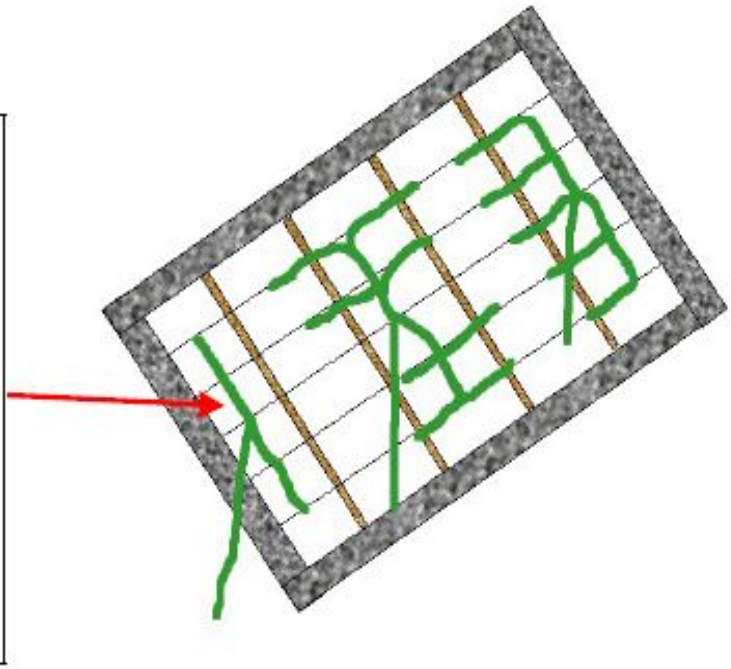
Trellis where only 2 wires were used

A = first winter prune
B = 2nd winter prune if the top shoots were not strong enough
C = 2nd winter prune if the top shoots were strong enough



The top view of an pergola – remember, the one I used at my swimming pool?

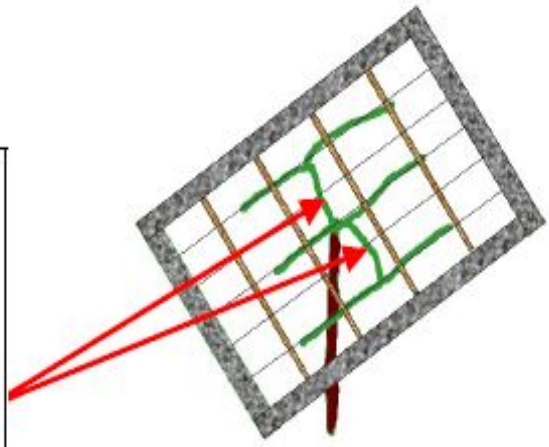
This is what you want to achieve in the second year. If the shoots were not long enough to reach the sides of the arbor, do not worry, you can always go further next year – remember to use strong shoots



Another top view of an arbor where the vine is in the centre of the arbor.

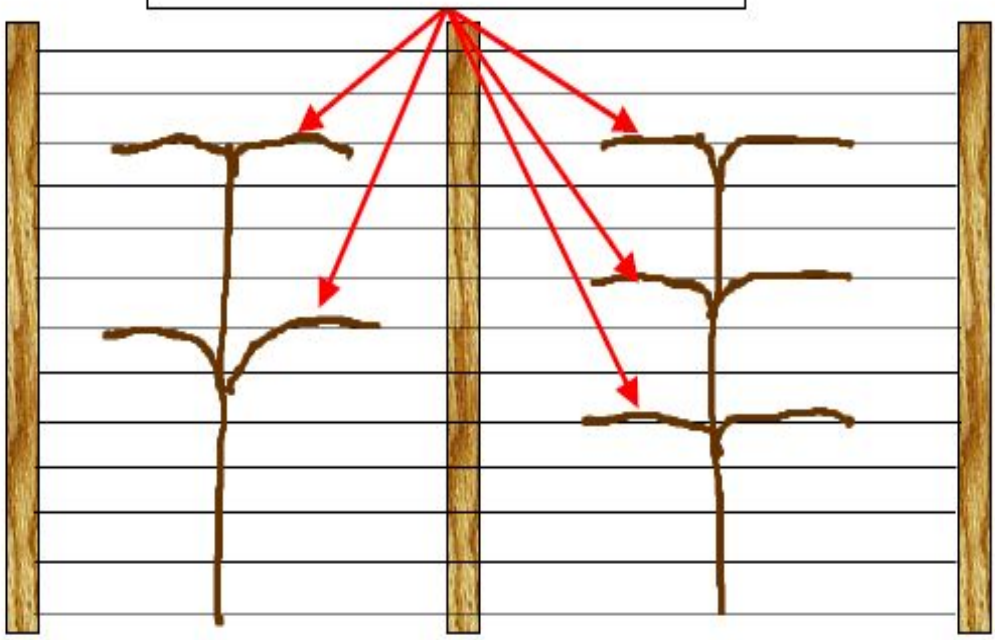
You can watch the video I have uploaded to YouTube how to train a grape vine on an arbor at the following address: http://www.youtube.com/watch?v=FFYv23O8jK8

Split the trailing shoot to get this. Try to establish these two cordons first, then go for the other cordons later, even if it is next year, just make sure these shoots are strong ones.



Maybe you have a fence on which your vine grows. If so, then prune the vine to look like this picture. It will guarantee that the vine will cover the whole fence during summer. This looks good when done properly!

Make these shoots 7 buds long, and tie it to the trellis wire, but do not develop the cordons or arms, closer than 6 inches apart.
Remove all the other remaining shoots.



I hope by now, you have a good idea of how you want the framework of your vine to look like.

One of the most important things to remember is to always use the strongest canes to make the framework and always twist the canes on the trellis wires and tie it to the wire with raffia or a string.

I started using strips of plastic, instead of strings recently; this ensures that the shoots are not strangled when they grow thicker.

Now the framework of your vine is complete. During spring and summer, new shoots will develop on the framework. You will notice how the shoots cover the whole area of the trellis. As the shoots grow long enough, you can tie them down to the trellis wires using plastic strips.

Chapter 10
The Basics Of Pruning You Grape Vine In The Future

What I am going to do in this chapter, is teach you the basics of pruning your grape vine. Your framework is now complete and you need to make sure you will have enough one-year-old canes to bear grapes. But before we move on, lets look at what canes to use for spurs and canes (long bearers) in the future.

The color of the wood:

In the picture below, you will see the green color of the cane when pruned. This means that the cane is alive and healthy. Do not use canes where the color of the pruning wound is a white or brown color (like in the second picture) – this could be a sign of cold damage or that a cordon is dying.

The diameter of the cane:

As said before, the diameter of canes you want to use for spurs or canes should more or less be the size of an ordinary lead pencil (3/8 of an inch).

If your grape vine grows vigorously, you will probably see some very thick (1 inch plus) canes, these are called “bull canes” and they are normally unfruitful or less fruitful. The nodes on “bull canes” are far apart, sometimes more than 6 inches and they have a definite flat side as well. Strong lateral canes develop on these bull canes. If possible, do not use bull canes for prune wood.

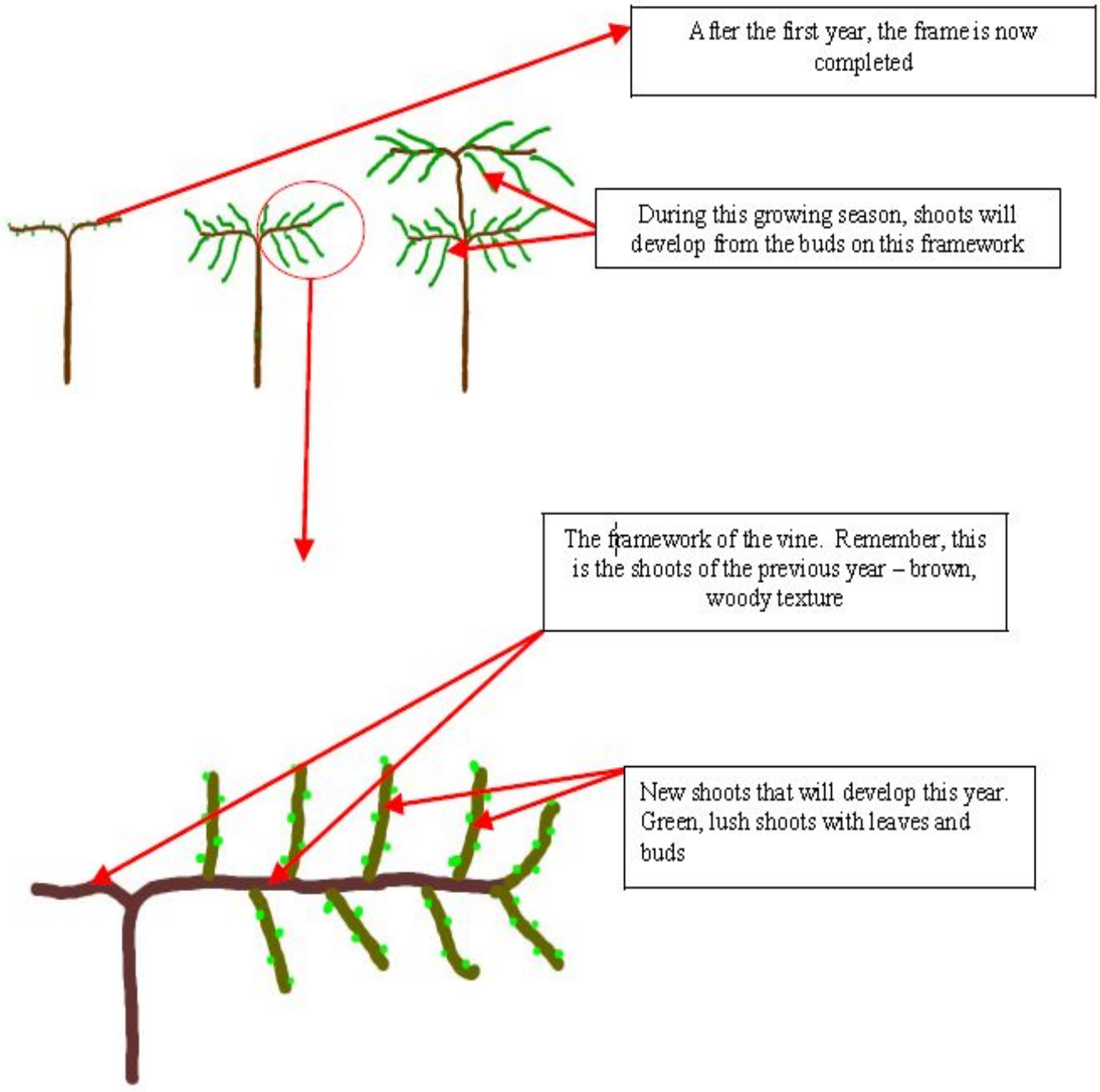
The picture below, is a Sultana (Thompson) “bull cane” that developed because of poor sunlight penetration into the vine. The cane on the left is the ideal diameter – notice the length of the internodes and the lateral canes.

On the other hand, don't too thin canes (like the one on the left below). These canes will not be able to produce strong, fruitful shoots.

Position vs quality of the canes:

If more than two shoots developed on a spur, and you have trouble deciding which one to use, it is best to choose a good quality cane than a good positioned cane. You can always reposition the spur next year. Remember, you want fruit not a good looking vine (although a good looking vine that bears lots of fruit is your ultimate goal :-)

The start of the 2nd growing season



During the next winter, these new shoots will loose all of its leaves and will mature. They will be pruned to short or long bearers (canes).

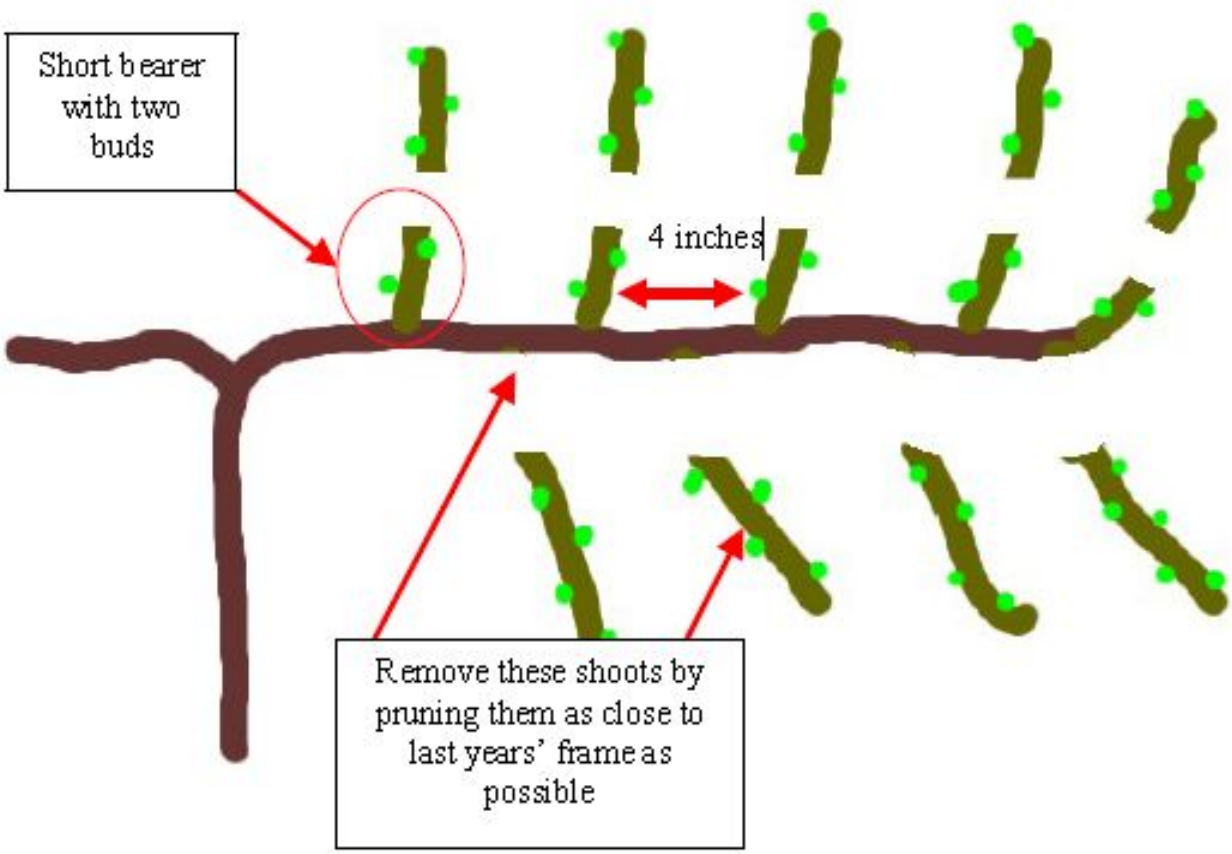
Chapter 11
The third year of growing your grape vine

Here we have two variations of pruning and training a grape vine; one for fruitful varieties and one for less fruitful varieties.

For fruitful varieties, you will have a cordon with 4 to 6 short bearers on each side of the main stem.

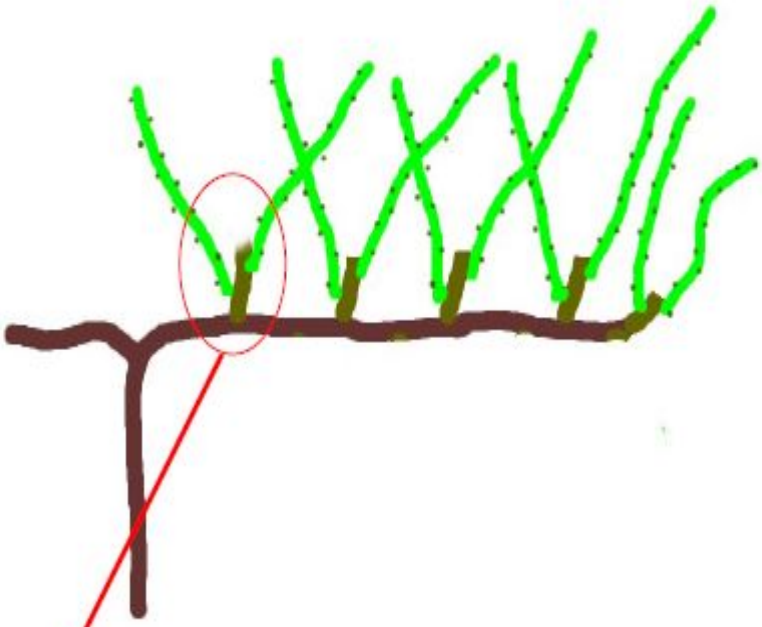
When it is time to prune (during the winter or close to spring), you will prune back the previous year's growth to 2 buds counting from the base of the shoot. Do not count the basilar bud (right at the bottom of the cane) as one of the 2 buds. Cut the shoots through the internodes, right in the middle between the 2nd and 3rd buds like in the picture below.

This will be your short bearer or spur. Depending on the trellis, you can space them evenly along the cordon, not closer than 4 inches apart. On a 2 feet cordon, I will only keep 4 spurs, and on a 4 feet cordon, 6 to 7 and so on. Remove all of the remaining canes, leaving you with only the frame and short bearers. You will notice that I choose canes in the upright position for my short bearers. By doing this, I ensure that the shoots that will develop from them, grows straight up. If you cant find a strong enough cane in the upright position, you may use one that is facing side ways or downwards, but this is not ideal.



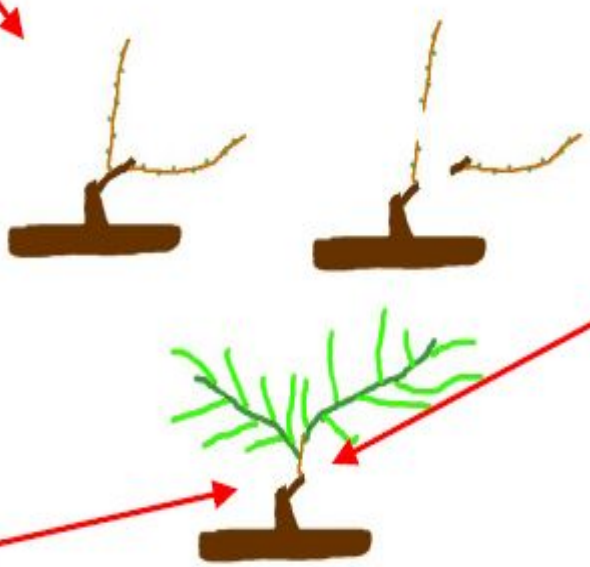
The start of the 3rd growing season

During the next growing season, all of these short bearers will develop shoots with leaves, buds and most of them grapes.



The start of the 4th winter and onwards

ENLARGED



This shoot will be pruned to be next year's short bearer and the other one will be removed.

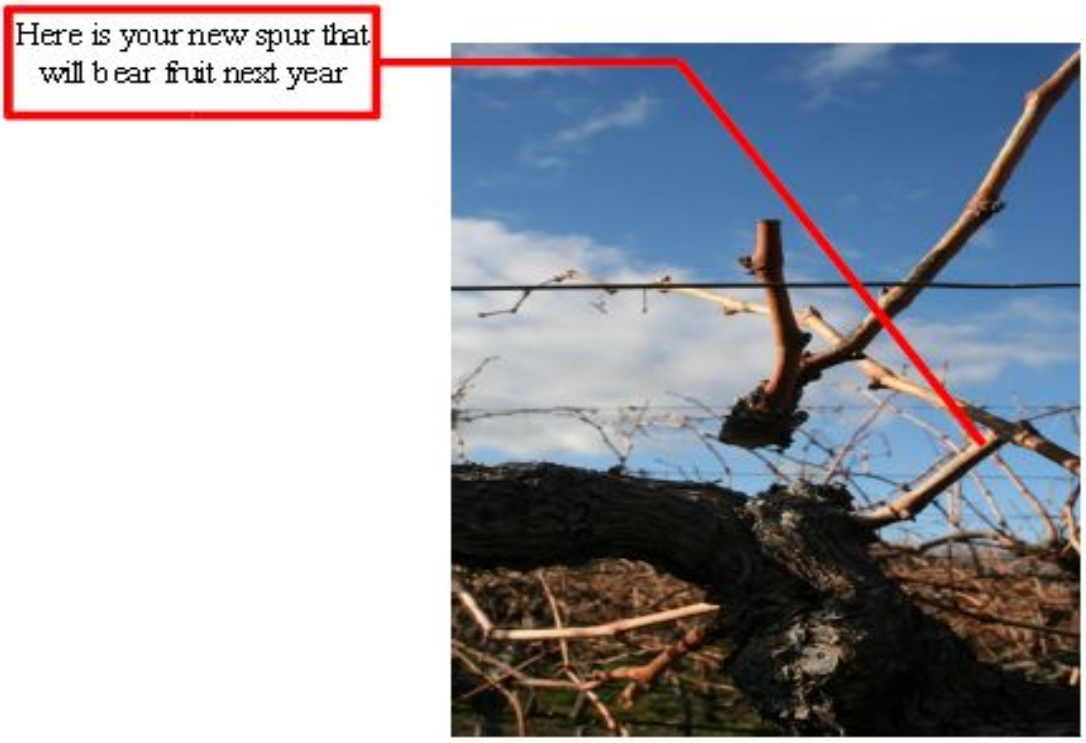
REMEMBER TO USE THE BOTTOM ONE, OTHERWISE YOU WILL BUILD UP THE BEARER EACH YEAR

During the previous growing season, the two buds that were pruned on the short bearer, developed shoots with grapes, leaves and buds.

During this winter, a piece of last year's short bearer is removed so that only the bottom shoot of last years growth remain. And that shoot is pruned back to 2 buds again.

You see, now the whole process starts over from the beginning

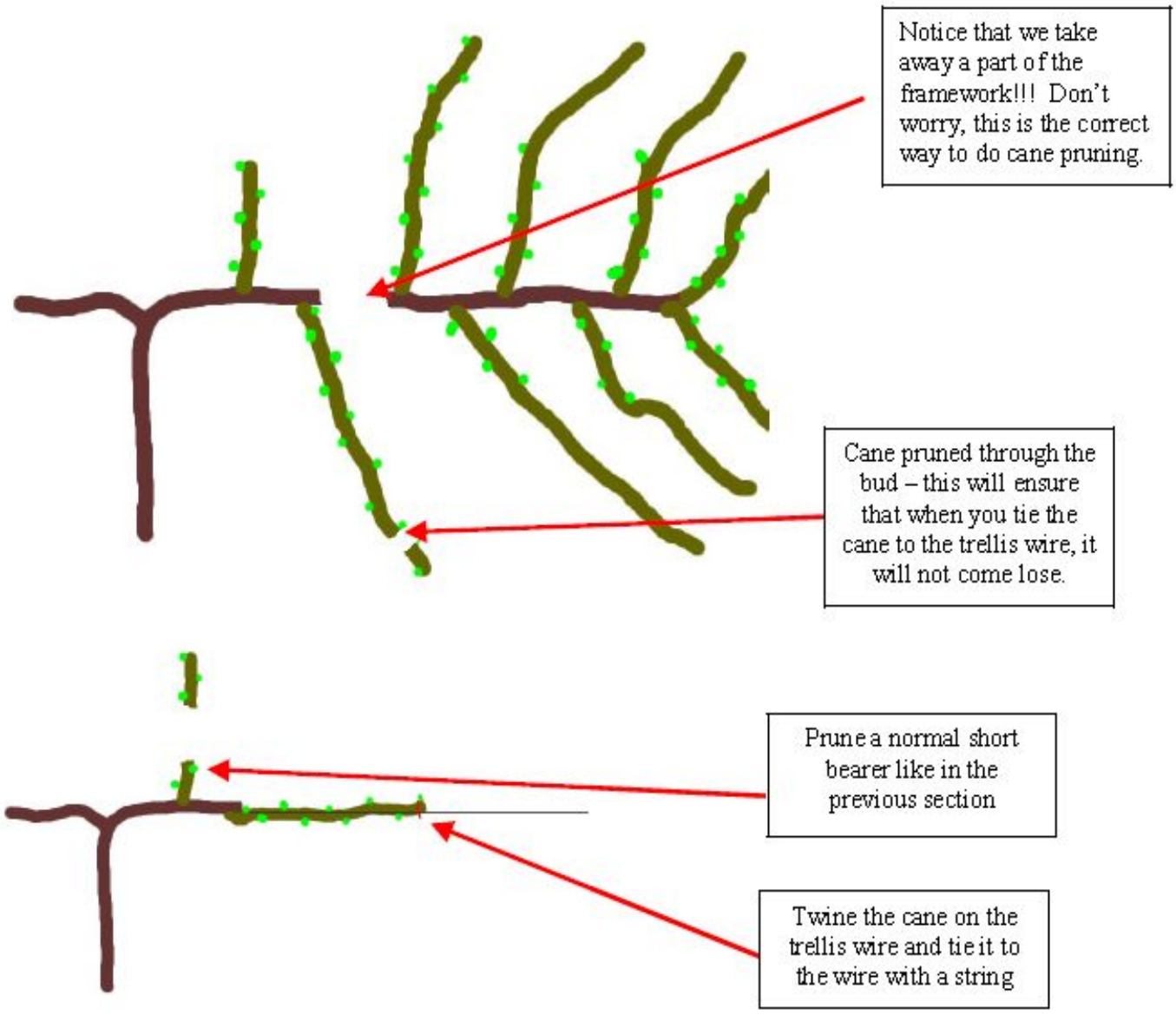
After years and years of pruning spurs on the same cordon, the spur will build up like in the picture below. If there is a cane available at the bottom of this spur, you must remove the old build-up section of the spur to renew it.



For the less fruitful varieties you will have a short bearer and one medium to long bearer Prune the short bearer the same as in the fruitful varieties.

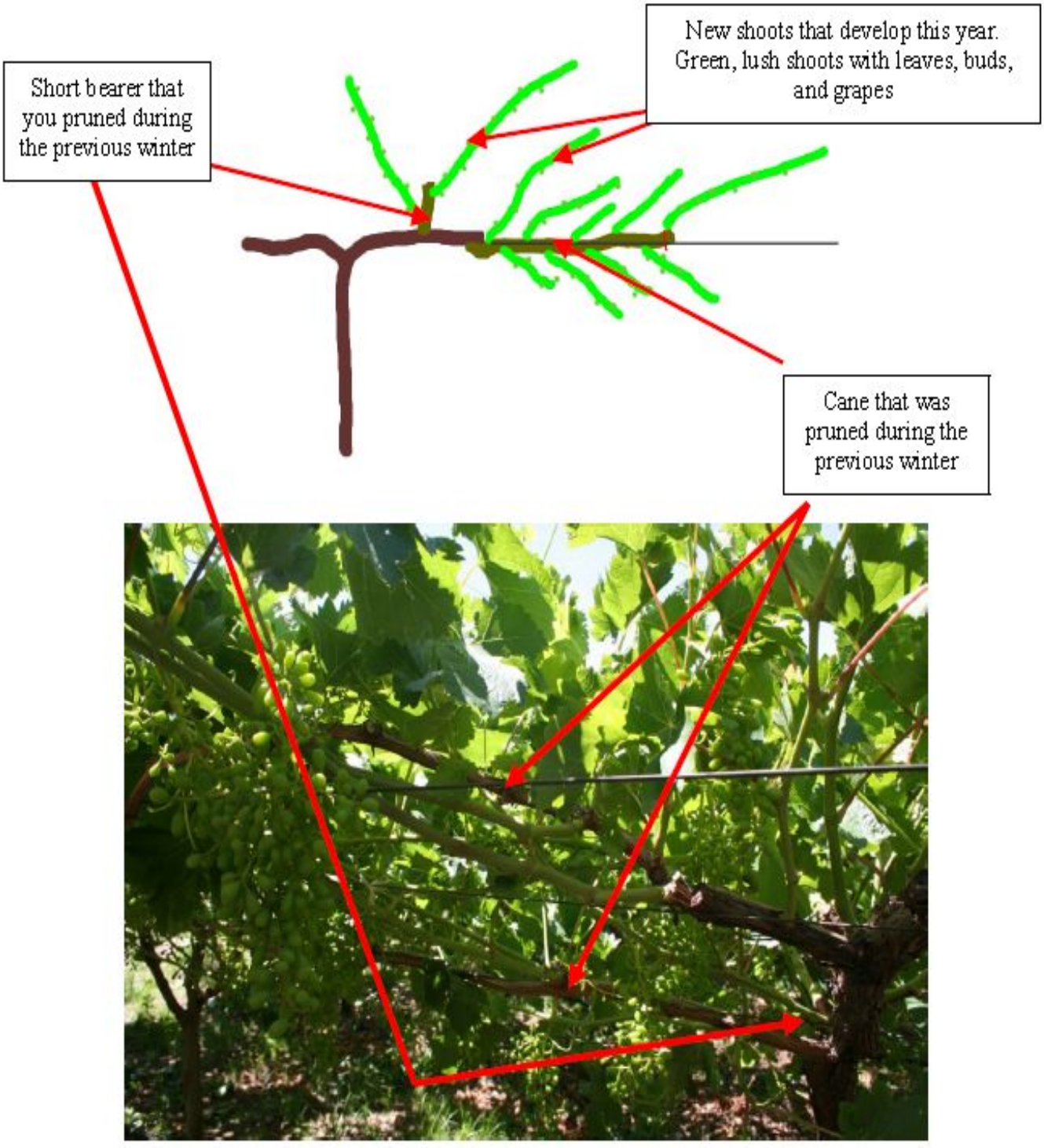
The long bearer (canes) is cut through the 11th bud. You can make this cane as long is you want, anything between 8 to 12 buds. Look at the pictures below.

The 3rd winter



The start of the 3rd growing season

During spring and summer, all of these short bearers and cane bearers will have shoots with leaves, buds and most of them grapes.



Chapter 12
The start of the 4th winter and onwards

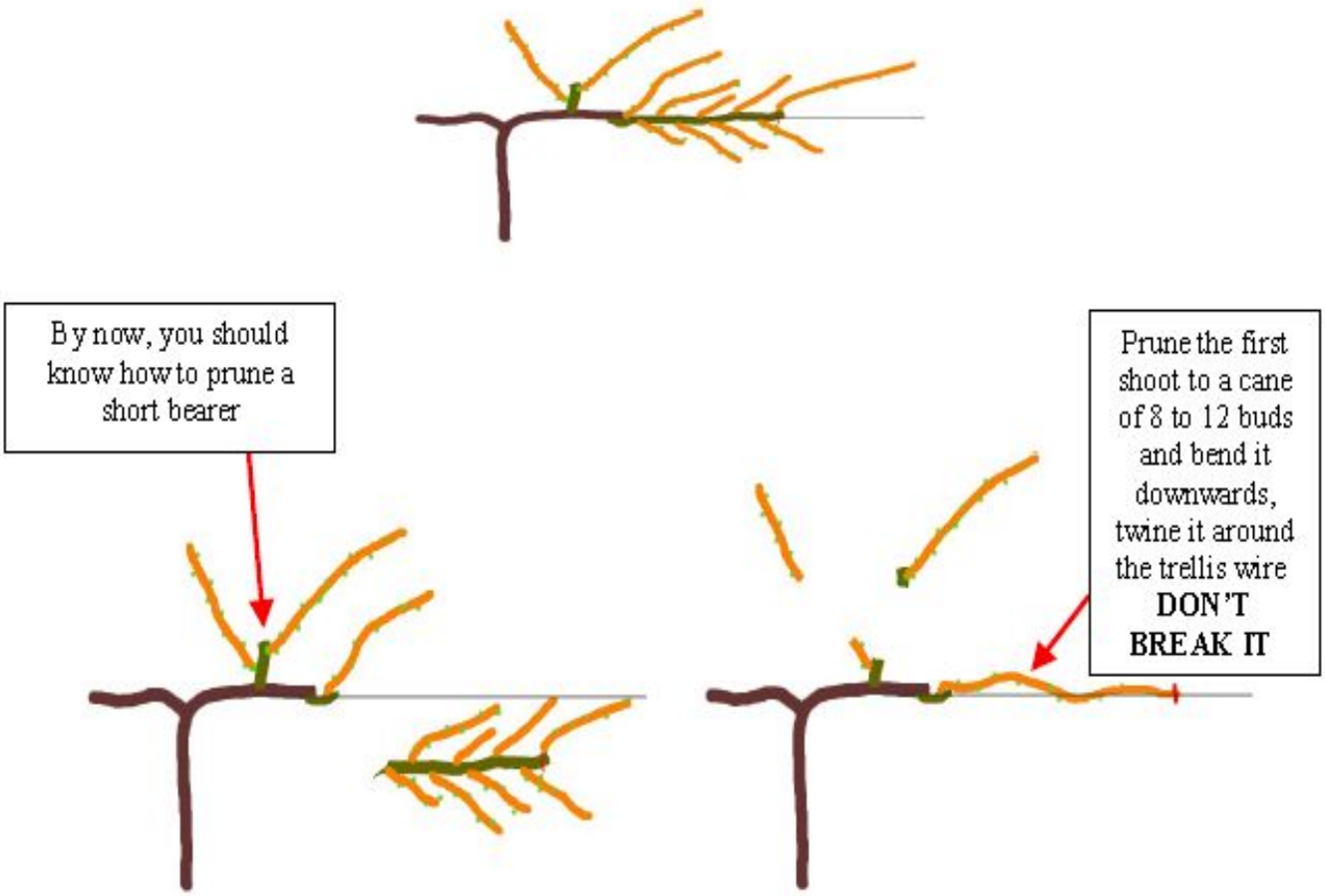
All the principles for pruning spurs stays exactly the same as in the previous year. Prune back the older part of the spur and prune last year's cane back to 2 buds.

For cane pruning it is important:

Always have at least one or two spurs for every cane bearer on your vine

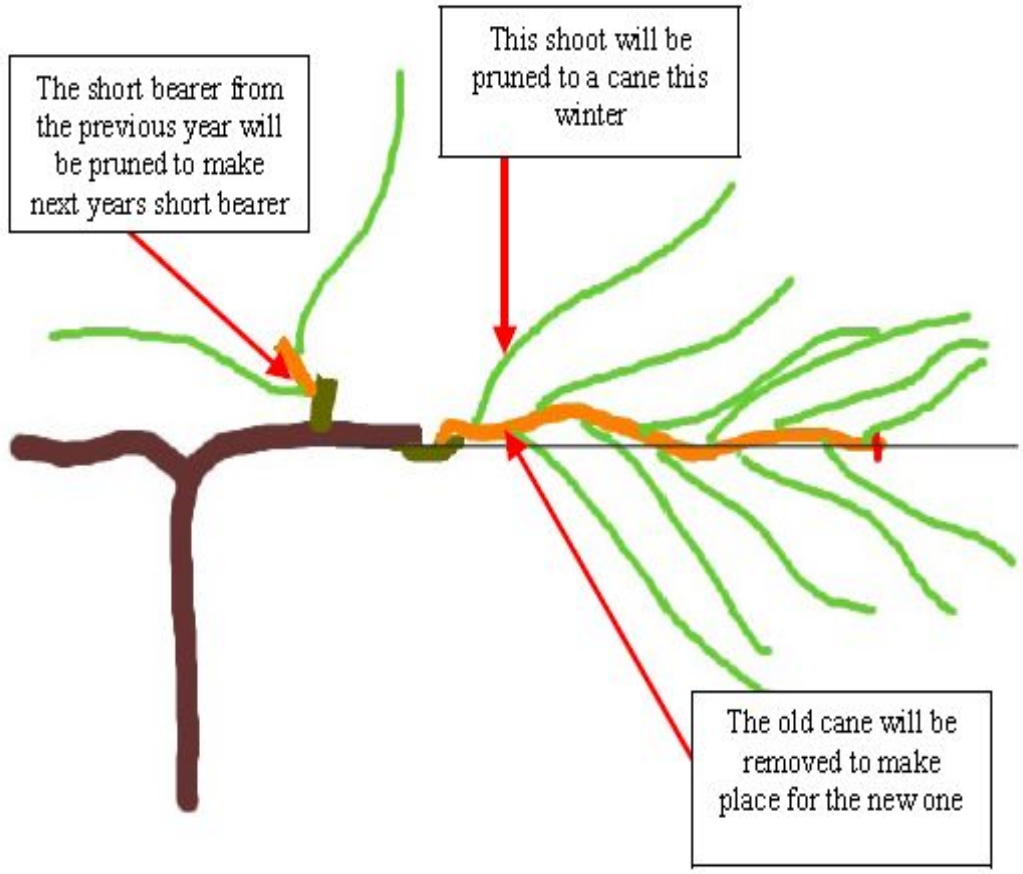
It is important, because you always want some insurance bearer you can fall back onto, if something should happen to the cane. One thing I do every 2 to 3 years is to replace the complete part of the cordon where the canes are pruned from. This is done using the top shoot from the spur and prune it as cane and the bottom cane from the spur I prune back to two buds. As you can remember, two shoots develop on the spur.

This method keeps your vine in shape and will bring all of the bearers closer to the original frame of the vine. Your aim must always be to renovate your vine as much as possible without loosing too much of your crop.



The next growing season and winter

During the next growing season, your vine should look something like this.

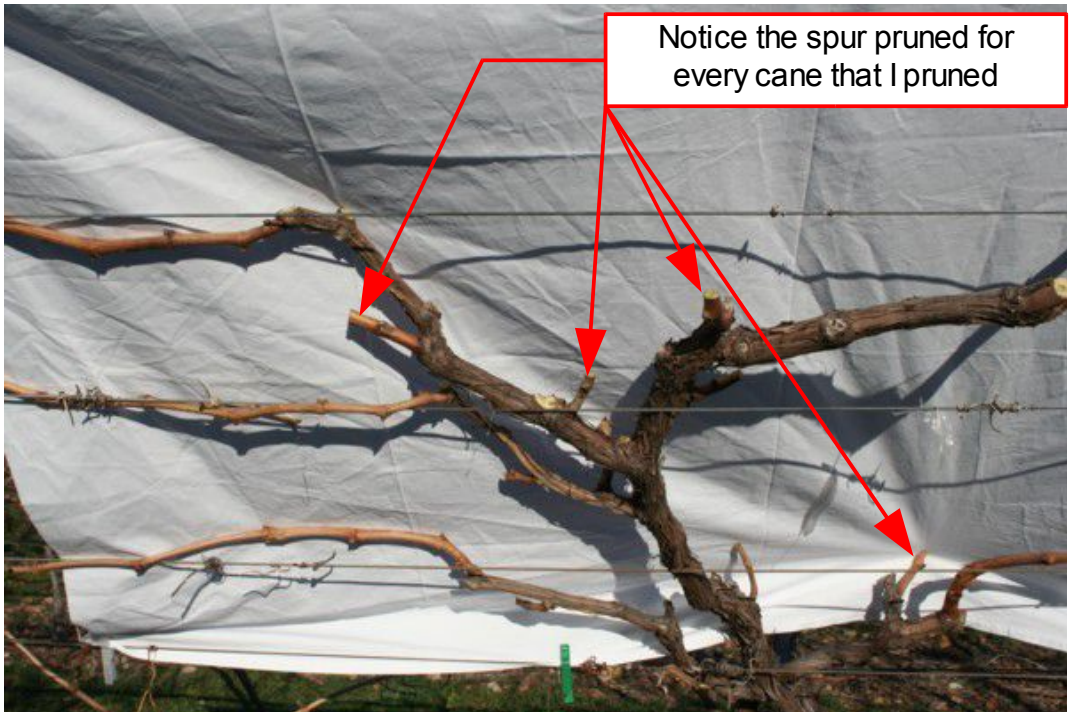


When winter comes, the whole process will start again.

Here are pictures of a grape Crimson vine that was pruned with 5 long bearers or canes.

Before

After



By now, you should know what a spur and cane bearer is. Always remember that your grape vine needs a bearer, short or long, to produce grapes. From time to time, you will notice that water shoots develop from the 2-year and older framework of your vine. These shoots will not produce grapes, and you will have to remove them from the vine, because they only use up nutrients needed for growth and to ripen grapes.

The only time you would want to keep a water shoot, is when you want to renovate the vine, because one of the canes or short bearers died or is not producing shoots anymore.

We have come to end of the training and pruning session of this e-book and you should be able to train and prune every kind of grape vine. If you have a grape vine that has never been pruned or incorrectly pruned, I would advise you to prune it back to the basic frame I explained in season 2. This will ensure that you can construct a new framework correct.

DO NOT BE AFRAID TO PRUNE YOUR VINE!

PRUNING STIMULATES GROWTH THE NEXT SEASON – AND THIS IS NO LIE.
+- 80 TO 90 % OF THE PREVIOUS YEAR'S GROWTH ON THE VINE IS REMOVED WHEN YOU CORRECTLY PRUNED THE VINE!

I SAY AGAIN, DO NOT BE AFRAID TO PRUNE – THE PICTURE BELOW SHOWS THE WOOD THAT WAS REMOVED FROM ONE SIDE OF THE GRAPE VINE ALONE!

Chapter 13
Watering your grape vines

"How much water is enough or how often do I need to water my grape vine?" is one of the most asked questions by home grape growers. This is also one of the most difficult one's to answer, because there are so many outside factors that will play a major role in deciding how long and how much to water your grape vines. Factors like your climate, soil type, soil drainage, wind speed, rainfall, topography of your vineyard, quality of the water, the irrigation system you use and even the canopy size of your vineyard will influence how much you will water your grape vine. I'm sure you will understand, that for me to tell you exactly how often to water a grape vine, is very difficult. I can only give you an estimates, but you need to experiment and test how much is enough.

To give you an example; one of my friends once called me to ask how much I water my Thompson Seedless grapes. I told him the frequency and duration of my irrigation schedule, but decided to go and visit him.

When he took me to his vineyard, I immediately noticed that his soil type was totally different from mine (more sandy), his vineyard was ridged because of impenetrable sub-soil layers (ridging will cause water to evaporate more, because of the greater soil surface) and his row spacing also differed from mine. I advised him (or should I say we came to an agreement) that he needed to water his vine more frequently but for shorter periods of time.

In the end, he nearly gave the same amount of water as I did, but his scheduling was very different from mine – by the way, he had a great crop that year.

Increasing the efficient usage of water in vineyards should be the goal of every grape grower on planet earth, as water is becoming more scares each year – global warming?? Therefore, the correct timing of irrigation and application of the correct amount of water are important to maximize crop production and irrigation efficiency.

Let's look at what tools you can use …

Measuring available soil water in vineyards:

Class A evaporation pan:

Class A Evaporation pan, is cylindrical with a diameter of 47.5 " (120.065 cm) and has a depth of 10 " (25.4 cm). The pan is mounted on a level, wooden base and is often enclosed by a chain link fence to prevent animals drinking the water from the pan

The Class A Evaporation pan measures the amount of evaporation (the process by which water is converted from its liquid form to its vapor form) that took place during a single day as the depth of water (in inches) evaporates from the pan. The measurement day begins with the pan filled to exactly two inches (5 cm) from the pan top. At the end of 24 hours, the amount of water to refill the pan to exactly two inches from its top is measured. Off course nowadays, there are fully automatic systems available, that takes the readings, store it in a database or even send the it via cellular phone to the farmer – it even refills the pan by itself!

Anyway, the measurement you take from “reading” the amount of evaporation is then used to calculate the evapotranspiration from the soil, grape vines and cover crop.

Tensiometers or Irometers:

A tensiometer is an instrument that reads the soil water potential (the direct energy needed or availability of soil water to the plant) and consists of a porous ceramic tip (cup), connected through hard plastic tube to a vacuum gauge - they come in different lengths. The tube is filled with distilled water and sealed at the top.

The tensiometer is placed into the soil, in the root zone of the grape vine - the porous tip, acts kind of like a root. When the soil dries out, the pressure on the outside of the tube will decrease and an imbalance between the inside and outside of the tube will occur. In order to equilibrate the pressure, water will move from the tube, through the porous tip into the soil.

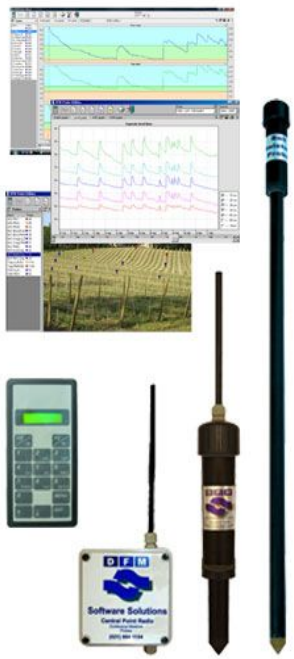
As the water moves from the tube into the soil, it will cause a vacuum inside the tube and the vacuum gage will show a reading in bars or kilopascal. Off course, when you water the vine again, the pressure inside the tube will be lower than on the outside and water will move through the porous tip, back into the tensiometer, lowering the reading again.

On the gage, 0 = fully saturated soils and 100 = extremely dry soil. One big disadvantage of using a tensiometeres is they need constant servicing as air is extracted from water under tension and becomes trapped within the tube, reducing the response time progressively until the instrument fails to operate.

Diviner 2000:

The Diviner 2000 is a portable soil moisture probe, designed Sentek in Australia. At each site, a probe tube is installed into the soil and when you want to take the readings, simply slide the probe down the tube, into the soil. The encapsulated capacitance sensor then measures the soil water of the root zone at different depths. The data is transmit to a handheld logger, which shows graphs of the available water in the soil. You can also connect it to your PC and download the data. With the software provided, it draws graphs of water usage at different levels, making irrigation scheduling much easier.

Probes:



I started using these probes last year, and must say, it is AMAZING what you can do with it! The DFM Continuous Logging Probe is a multilevel soil water content and temperature logging device. The progressive, newly upgraded probe takes readings on 6 depths and at hour intervals and stores it locally for up to 60 days. Data can be downloaded to a mobile logger or to a central computer with the use of 1.2km long distance radio model.

In other words, you don't have to visit the site where the probe is installed if you have a radio model! On my farm, the sites where the probes are installed is relatively far apart, so this makes the job much easier. You can visit their site at http://www.dfmsoftware.co.za

Practical tips for the home grape grower:

Even with all of these instruments (and there is hundreds more on the market) to our disposal, you should always physically test your soil water level. You can do this digging a hole 2 feet away from the vine, about 2 to 3 feet deep – this is where most of the roots of a grape vine situated.

From the bottom of the hole, take some soil in your hand and press it as hard as you can.

If you open your hand and the soil particles stick to each other like a mudpie, and you feel your hand getting colder (transpiration of water), you know there are still free soil water available in the soil.

If the soil kind of crumbles after opening your hand, and you feel no transpiration of water, then most of the time, your soil is too dry and you need to water your grape vine.

With the help of the above instruments and physically testing the soil this way, you can easily build knowledge of how wet your soil really is when say for example a tensiometer reading is 30 cu. I do advise you to do regular physical tests.

The role irrigation has on fungus diseases and nematodes in vineyards:

Any form of irrigation normally helps the start and spread of nematodes and fungus diseases, but not all irrigation methods has the same effect. Normal sprinkle and drip irrigation will not have a huge effect on the spread of the diseases, if not applied directly on the leaves of the vine.

There are a few factors that influence the effect irrigation has on the spread of diseases. The interaction of the climate created by the water, the pathogen involved, and the grape variety will influence the spread of the disease.

During irrigation, the microclimate surrounding the grape vine, changes. The water reduces the air temperature, especially when sprinkle irrigation is used. The humidity around the vine, increase due to evaporation of water and it is a known fact the increase in humidity will increase the chances of spreading a fungus disease. Watering a grape vine, will increase the vigor of the vine, as we all know and a more vigorous vine will overshadow bunches. It is found that shaded bunches will be more susceptible to grey rot than bunches in direct sunlight, because the circumstances for spore development and spreading is much better.

The presence of downy mildew during the late summer in countries like Australia and South Africa, is mainly because of the effect irrigation has on the micro-climate surrounding the vine, therefore, you need to sustain your fungus spray program as late as possible.

There are three cycles in the life cycle of a fungus; sporation, spreading of spores and finally the germination and establishment of the spores. A fungus disease like downy mildew needs “free water” for the sporation and establishment of the spores to take place and the water drops of sprinkle irrigation or rain, can spread the spores. The germination then takes place when the climate conditions are ideal and spores will form shortly there after. The whole cycle starts over again and this within 48 hours! Nevertheless, with enough spores present, free water and an ideal climate, this disease will spread like a field fire.

When we look at nematodes, very little grape growers actually know the levels of dangerous nematodes (there are good ones present as well) in their soil. Nematodes damage the roots of the grape vine by attaching itself to the roots and sucking juice from it. This will prevent the roots of the vine to function normal. Nematodes can also cause secondary virus infections like fan leave.

In previous years, farmers from California increased the amount of water they give, to compensate for the loss of water and nutrition uptakes due to fact nematode damage of the roots of the vine. This had a snowball effect, as more water will spread nematodes much quicker. Nowadays, a more regulated watering schedule and the chemical and biological removal of nematodes decreased this problem dramatically. When planting new vines, make sure your soil is free of nematodes, otherwise your vine will never be a healthy vine.

I want to urge you to never use overhead irrigation (if possible) on grape vines. The disadvantages of using this irrigation system are so many; it will never justify its use. Rather use a drip or micro irrigation system that will not spray the shoots and leaves of the vine.

When fungus diseases are a big problem in your area, try to water your vines very early in the morning or during the evening. This gives the vines time to dry off, before the temperatures will rise to levels where fungus diseases will spread.

The reaction of the grape vine to certain soil-moisture conditions:

Thousand of years ago, the Asians and people living around the Mediterranean Sea grew grapes, so the grape vine adapted (adjusted) to do well under hot summer conditions.

Although the grape vine is classified as a mesophyte, a plant that grows under moderate moisture conditions, it is well adapted to dry or drought conditions. It is a well known fact that a grape vine uses much less water than a normal deciduous fruit tree.

1. **Intake of water by the root system:**

The main reason a grape vine can survive in very dry conditions, is its well-developed and deep rooting-system. Although most of the grape vine's roots is found within the top 400mm of the top-soil, these roots are more evenly spread than those of other plants. Therefore the rule that most of the water withdrawn by a plant happens in the topsoil (40% of moisture in the topsoil and 10% in the subsoil), is not quite true when it comes to growing a grape vine!
The withdrawn pattern of a grape vine is much simpler and differs; the more roots, the higher the uptake, whereas depths do not play such an important role.
The roots of a grape vine, on sandy or gritty soils, can penetrate the soil as deep as 6 meters (19 feet)!
Moisture is taken up the quickest in fibril area, just above the active tip of the growing root, and slows down as the older parts of the root system becomes corky. These active tips grow towards the moisture comprising soils, even if it has to grow 6 meters deep!
Although a grape vine adapts to these dry conditions, it is not ideal, because once you water your plant, you will have to give much more water to reach the fibril area of the roots. Under normal growing conditions, the fibril area is within that 400mm I mentioned above.
Under extreme heat conditions, it is essential that you keep that 400mm well watered.

2. **The leaf surface (area):**

During the early stages of the growing season, the leaf surface of the vine is small and transpiration (the lost of moisture through the leaf) is not a big factor. But as the growing season moves on, the total leaf area becomes bigger as leaves grow bigger and much more transpiration will occur. under extreme heat conditions, the vine will transpire more moisture than the roots can take up, and this causes the leaves to look withered (temporary withering).
The vine is under a great deal of stress during this stage and you need to lower the temperature of the microclimate around the vine. The only way to achieve that is to apply water, so that the soil temperature will decrease.

Normally what happens is, the vine will extract water from all the available sources (roots, stems, shoots and grapes) to compensate for the lost of moisture through the leaves - this has a negative impact on berry size, because the much needed moisture (a grape berry is +- 95 % moisture!) is extracted from it.

One more thing to keep in mind, is that the larger your trellis system or arbor is, the higher the total leaf area will be and of course the higher the transpiration will be. A large growing vine will use much more water in one year, than a small vine because of transpiration.

3. **The vegetative growth of the vine.**

Under normal moisture conditions, the vegetative growth of the grape vine will be very high during the start and middle of the growing season but will decrease dramatically as the season goes on and berries start getting bigger. Unlike normal fruit trees, a grape vine will never develop a terminal bud,

and will grow as long the circumstances is ideal for growing.

You will notice that the active growing points of your vine will have a yellowish/green shine and the older leaves will have a much darker green appearance. One certain way to know that a growing vine is under soil moisture stress, is when active growing points become a dark green color - it is not a red danger sign, but a green danger sign, pay close attention to the growing points of your vine, as they will show you how happy your vine is.

Maintaining a good soil moisture throughout the season will ensure a well grown, productive vine BUT a grape vine "hates" wet feet, so don't overdo this (by the way, the symptoms of too little water and too much are exactly the same, so be careful).

Chapter 14
Spring and summer treatments for your grape vine

In this section of this e-book, you will learn how to treat your vine and grapes during spring and summer. These treatments will ensure top quality grapes.

However, before we go further, let us first look at the different stages a grape berry and cluster goes through during the summer.

1. Cluster forming:

Clusters that develop on a vine didn't develop this year, it developed inside the but on a shoot, during the previous season! Remember how I nagged about proper sunlight exposure? Well, this is the reason I kept on telling you that. You need to have proper sunlight exposure for this cluster (microscopic in size) to develop.

2. Visible clusters:

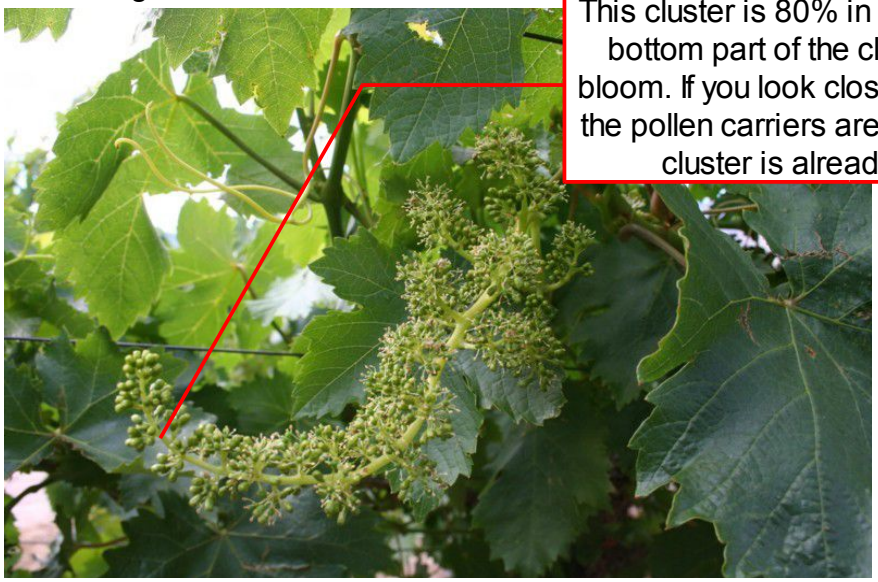
This is the stage were clusters become visible. This varies from variety to variety but the first clusters usually become visible at 4 inch shoot length.

3. Blooming:

This is the time when the pollen is released on the stigma of the berry. Remember I told you that most grape varieties don't need cross-pollination, this is why! During this stage of the development of a berry, the vine is usually under great stress and needs special care.

DO NOT LET THE VINE DRY OUT TOO MUCH AND DO NOT GIVE ANY FERTILIZER DURING THIS STAGE!

The reason you must not apply fertilizer, is because the vine will abort its berries when it is growing too vigorously. This is where many grape growers make the worst mistake they can. Stop fertilizing 2 weeks before bloom is imperative! Remember this, please! Rain during this stage will also have a negative effect on blooming.



This cluster is 80% in bloom. Notice the bottom part of the cluster still has to bloom. If you look closely, you will notice the pollen carriers are visible where the cluster is already blooming.

The development of a grape berry:

The development of the grape berry happens in four phases during a single season. Each of these phases plays an important role in the development of quality grapes and berry size.

Phase 1

Phase 1 starts when blooming ends and the berries start growing in size. The duration of this stage is about ten days and ends when the first grape-stones (pips) develop.

During phase one, there is very little increase in the size of the berries and all the unfertilized flowers aborts from the vine, leaving only fertilized berries on the clusters.

Phase 2

The duration of phase two is three to six weeks, depending on the climate conditions and variety.

Pips start to develop and cell division starts. Because of cell division, the berry increase in size at a phenomenal rate and photosynthesis takes place inside the berries itself.

Phase 3

The start of Phase 3 starts when there is a decrease in rate the berries gain size and the duration of this phase is about two to four weeks, again depending on the climate and variety. The main characteristic of this phase is veraison (coloring) of the berries.

Phase 4

After cell division ends, the cells of the berry start to increase in size (cell enlargement). During phase two, the increase in size were because of cell division but in phase four increase in berry size is because of cell enlargement. The grape vine needs enough water during this phase. If there is as a lack of water, the grape vine abstract moisture from the berries and this will result in a smaller berry size.

During phase four, the accumulation of carbohydrate (mainly glucose, fructose and sucrose) takes place and forms part of the ripening of the fruit.

What happens during the above mentioned phases?

Sugar Development of grapes:

Phase 1 and 2, there are very little sugar in the berries and almost no fructose is present in the berry, only glucose. The berries in phase 1 and 2 are acidulous gathering organs of the grape vine.

The total dissolved particles in a grape are mostly sugars and is measured in Brix (degrees Balling) with an instrument called a refractometer. 1*B equals 1 gram of dissolved sugar in 100 ml grape juice.

During phase 4, veraison, the berry changes into a sugar accumulating organ and sucrose and fructose levels inside the berry is almost the same. The whole metabolism inside the berry changes and that is why we notice a decrease in the rate of berry enlargement.

The level of fructose increase as the berries ripen until there is a higher level of fructose inside the berry than there is glucose or sucrose. At this stage the berries are ripe. Leaving the clusters on the vine will result in a to high level of fructose and this stage is, know as overripe.

Acid development inside a berry:

Tartaric acid and malic acid are the two main forms of acid in a grape and is responsible for more than 90% of the total acids levels. Citric acid is the third most important form of acid in a grape but it is only 0.02 to 0.03 % of the total acids.

There are more than 20 different kinds of acid in a grape, but they are present in very low quantities inside a grape.

During phase one and two, tartaric acid and malic acid levels in the berry is very high and decrease at the beginning of phase three of berry development. The reason why the acid levels inside a grape berry decrease is mainly because of the conversion of acids into sugars by the vine, the dilution of acids because of the change in volume of the berry and an increase in the respiratory usage of acids, by the vine.

The level of acid inside a berry is measured in pH and plays an important role in the development of coloring pigments (especially in red wines) and for taste. A table grape with very low acids, normally has a lower shelf life than one with a bit higher level of acid. Overripe grapes will have a very short shelf life.

The aroma development:

We often hear wine lovers say a wine has a great aroma. Where does this aroma come from?

There are two groups of aroma you find in wine:

1. Natural which is formed inside the grape and gives the wine a natural aroma
2. Fermentation aromas which are formed by the fermentation cells

The total aroma content of a wine is about 0.8 to 1.0 gram / liter, depending on the variety and climate in which the vine is grown. The precursor of the natural aroma of a wine is produced inside the leaf of the vine and transported to the grape berries.

Coloring

A wine gets its color from coloring agents found in the hypodermic, just underneath the skin of the berry. The green color of berries that is not ripe yet, comes from chlorophyll inside the skin of these berries. Because there are no coloring pigments inside the skin of a white wine grapes, it has no color and therefore there is no use keeping the skins and juice together while fermentation is in progress, but with red wines, just the opposite happens.

Summer treatments:

Fastening of bearers and shoots:

As you will recall, we have tied the canes to the wires when we pruned the vine during the winter and you need to check if they are still tied, otherwise they will hang loose from the canopy when the grapes on these bearers get heavier.

As soon as the shoots of your vine are long enough, you must twist them on any available trellis wire, so that it gets maximum exposure to sunlight (see I told you I was going to mention it again :-). (That is why we leave a wire open between two cordons!) Another reason why we do this, is to ensure that strong winds will not break off these shoots – remember they are the production center of your grapes! You can even tie these green shoots to the trellis wires with a plastic strip, so that it will stay in place, no matter what.

Remove any water shoots that will develop and keep the trunk of the vine clean (remove water shoots).

Removal of leaves:

The leaves are the main source of energy of the vine. Carbon dioxide is assimilated inside the leaves and provides a source of organic nutrition to the plant. The leaves of the vine have more purposes – it helps with enlargement of cells (larger berries), colour of the grape-skin and the sugar of the juice inside the berries.

What leaves should you remove?

Remove all leaves touching the grape clusters. These leaves shade the cluster and graze or damage the skin of the grapes – looks ugly! Removing leaves that touches the framework of the vine, will ensure better sunlight penetration into the vine and this will have a positive effect on ripening of buds (more fruitful), ripening of fruit, and less diseases.

Be careful not to overdo this though, because the vine needs enough leaves for nutrition. A rule of thumb I use, is to look at the shading of the leaves on the ground at mid day. There must be at least 25 to 35 % sun patches on the ground – no more, no less! Don't use the gap in the canopy of a slanted trellis as part of your measurement!

Look at this picture, it will show you how many to leaves to remove and how many not to remove. This is what you are looking for! All the leaves removed from the frame and grapes.

This is a bit too much – I am still looking for the guy who did this! :-)

Thinning out of bunches:

Personally, I hate this job, because it takes up a lot of time and labor. If you will use your grapes for wine or grape jelly, then doing this is not necessary. However, if you will use it in salads, for eating and to make your neighbor jealous, then you must do this. The thinning out of the clusters is the removing of uneven berries and berries that make the cluster too compact.

A cluster of grapes that is too compact, will cause bruising of the nearby berries and will prevent normal berry size development and coloring of the cluster.

Although it is a time consuming job, it is worth the trouble, because you will get bigger berries and much better color. The way I do it, is to remove all unnecessary berries, too small and too many, by hand or with a blunt scissor. Remember to use a blunt pointed scissor, so that you will not harm the remaining berries.

I will say it again. It is a horrible job, but you will reap the benefits!

Flame Seedless before thinning out by hand

Flame Seedless after thinning out by hand

When you look at the two pictures, you will notice that the top grape berries have some kind of wax layer that protects the berries. During the thinning out process, this wax layer normally gets rubbed off. This is not ideal, as the wax layer protects the grapes from sunburn and diseases. Minimize the removal of this wax layer as much as possible.

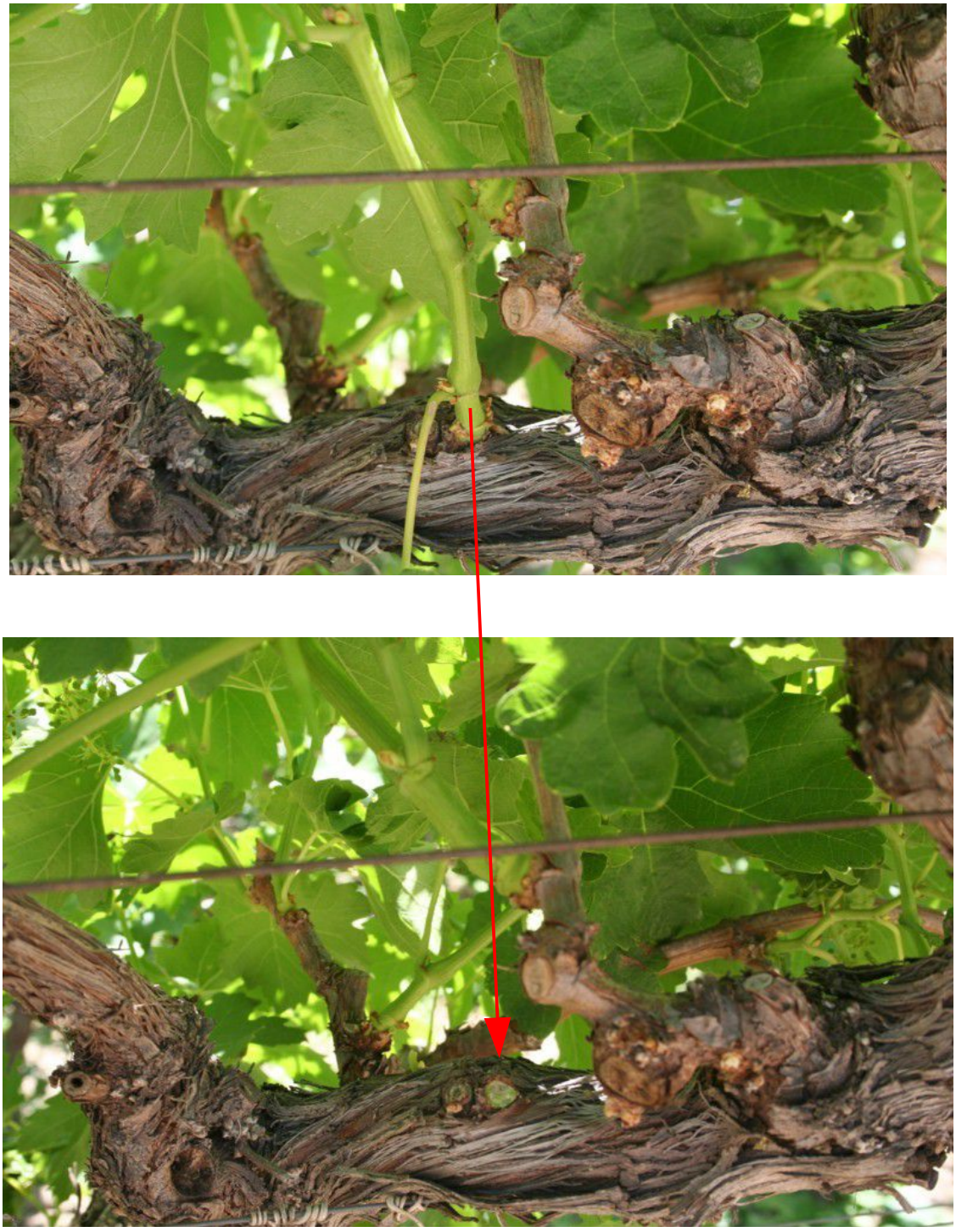
Commercial farmers use many different techniques to thin out grapes. One of the most common ways to thin out varieties like Sultana and Crimson Seedless is to apply gibberellic acid (GA1), a natural plant hormone that is sprayed on the vines during full bloom. Trying this at home, without some careful thought, can have devastating results and is not recommended for the home grape grower.

Sizing the bunches:

In order to get a reasonable berry size, I would recommend that you make the bunches or clusters smaller than its natural size. Do this AFTER fruit set. Make the cluster 8 to 12 shoulders in length counting from the top most shoulder (the one near the bearer)
Here you see a Sultana cluster with 8 shoulders – this will be a +- 700gram or 1.5 pound cluster and it will have berries with a diameter of 21 to 23 mm (so I hope!)

The removing of water shoots:

As mentioned before, the removing of water shoots is an excellent way to prevent your vine from compacting too much. A too compact vine (too much growth), with way to many water shoots, will result in poor color and infertility. Pruning during winter is also much more difficult because of so many canes that have to be pruned. You as a grape grower will only benefit by removing these shoots.



Chapter 15
Common diseases you may encounter

Before you go on with this section, I urge you to read the following carefully!

This e-book and links from this e-book may report the use and/or research involving chemicals and pesticides. It does not contain recommendations for their use, nor does it imply that uses discussed here have been registered. All uses of pesticides must be registered by appropriate State and/or Federal agencies before they can be recommended. Always keep in mind that agricultural chemicals are dangerous and can be harmful.

DANGER OF CHEMICALS

Chemicals (even fertilizer and table salt) can be hazardous if used incorrectly.
Incorrect use includes the following:
- Use in ways not specified on label
- Use for other purposes than specified on label
- Use by uninformed people
- Negligence – transport, application, storage
- Use of unscheduled/unregistered substances (be careful of mixtures) Consequences of incorrect use
- Accidental or intended poisoning of people/animals
- Home-made mixtures can cause unexpected and potentially dangerous chemical reactions
- Resistance of pest organisms develops; often because of the use of wrong concentrations
- Secondary poisoning of people and animals
- Poisoning of non-target organisms

Now that you understand the dangers of chemicals, let us get to the point of pest control. Keeping your vine in shape and not allow it to become too compact will help you to prevent many of the diseases found on grapes vines. A well “ventilated” grape vine, where there is enough airflow and sunlight penetration, is much more disease free, because most of theses diseases needs, humid, dark, and stuffy places to breed and spread.

Control your vine’s growth and you control 75% of fungicides on your vine. If you irrigate, do not spray unnecessary water on the leaves of the vines. Some fungicides need free water to spread, like downy mildew.

Because this e-book sells internationally, and there are many different laws on spraying products for different countries, you will need to ensure the products I mention is registered for use on grapes in your country. If I mention a brand name or product, it is for information purposes alone. What I can do is to give you an idea when to spray, so you will have an obliging spraying program.

You need to contact your local nursery to get the spraying products for the certain diseases registered in your country.

However, you are free to email me and ask for specific help.

Here is the link to the basic spraying program

These are the diseases you may encounter:

Downy mildew

Downy mildew is a fungal like disease that is specific to grapevines. It attacks all the green tissue, including leaves, shoots and flowers. Downy mildew normally appears after the rain, followed by hot and humid conditions. This is a devastating disease if it occurs during flowering.

Damage: High infection can cause the vine to abort all of its berries. Leaves show an oily, brownish patch on the top side and a white, hairy (fungus) growth on the bottom side opposite the oily patch.

Control: It is advisable to start a pre-harvest spray program and to continue to use a spray program throughout the whole season. Check with your local nursery or state department what chemicals to use – don't let this one catch you, it is really devastating!

Here is an experiment I did to show you how quickly this disease can take over your vines.

Picture taken 19h30 the previous day:

Here you can see an "oily" yellow patch on the top side of the leaf. This is the first signs of downy mildew.

Bottom of the leaf - if you look close enough you will see some white hairy fungus growth

If you take the leaf and put it in a wet plastic bag, and inflated the bag with hot hear and sealed it with a zip tie. This is the perfect conditions for downy mildew to develop - hot, humid conditions

12 hours later ...

Never mind the withering of the leaf, although it's obvious where it started, but take a look at all the fungus growth in just 12 hours! This disease can destroy your grape vine in 48 hours. Be on the look out for those oily yellow patches on the top side op the leaves - if you find them, be warned and take immediate action. Normally a contact/systematic pesticide will do the job, but prevention is better than cure - spray your vine upfront.

Botrytis or grey rot

Scientific Name: Botrytis cinerea

Symptoms depend a lot on the weather at the time of infection. Symptoms are seen most easily on berries when rain occurs at or near harvest.

Leaf and shoot, infection usually follows wet, windy weather, frost and hail damage. Botrytis needs high humidity or free moisture for 12 to 24 h to infect young vine tissues. Symptoms are brown, greasy dead patches on young shoots and girdling and death of young shoots. Flowers become brown, soft and rotten. In humid weather, rotting spreads along the main cluster stalks, and can result in rotting of young bunches. In hot, dry weather, damaged tissue dries out and the rot stops. Symptoms on berries occur at or near harvest, after rain. Infected berries crack and produce much grey to brown tufts of spores. Berry rot usually appears 3 to 5 days after rain.

When and where: The disease is usually seen after long rains near harvest, particularly as the sugar content of the berries increases. Large losses in table and wine grapes occur when grapes rot on the vine. Losses in table grapes occur when juice leaks from damaged bunches during transport and causes rotting in storage. Other bunch rotting organisms also grow on cracked and rotting berries, increasing losses.

I've seen grape growers loose whole crops because of this disease

Control:

The timing of fungicide sprays for Botrytis control is unclear on many fungicide labels, but it is generally considered that sprays are most effective when applied at **early flowering**, 80% capfall.

Spraying a product like Rovral (iprodione) when symptoms are visible will help protect the grapes from inoculation with spores.

Pierce's Disease or PD on grapes:

Pierce's Disease, also referred to as PD, is a disease in specific plant life that reduces their ability to use the soil for its nutrients and water. It is a bacterium that clogs the vessels in the vine that draws these two necessary items from the soil underneath it. Essentially, what happens is that the vine starves, unable to get the necessary elements; it occurs very slowly and ultimately dies. PD (Pierce's Disease) effect grape vines, as well as stone fruits, citrus, and almonds.

Back in the late 19th century, a pathologist investigated the first Californian outbreak of the disease and thus the disease was subsequently named after Newton Pierce. However, the disease has been in existence since the 1880's, when it was then known as Anaheim disease, because it was within the Anaheim area that it was first discovered.

Throughout the years, vineyards have had to fight PD over and over. Severe outbreaks have occurred and after much research and testing, it was discovered that Pierce's disease is spread by an insect.

The Physiology of PD and what parts of the vine it attacks

Pierce's Disease is a slow killing plant disease. It can take up to one year before the vine will begin to show symptoms and signs of the bacteria. It can then take up to three years before the plant will eventually succumb to death by the disease. How can you tell that the grape vine was withered by PD? Well, once killed it is black and very withered. However, there are signs of other symptoms before it reaches that stage. For example, when infected, the vines may promote shriveled or dried grapes, leaves that are underdeveloped, discolored vines, and even growth troubles, it will not be as large as it should.

The insects that spread this disease through grape vines is called the blue-green sharpshooter and the glassy-winged sharpshooter. These are tiny, flying insects that are essentially known as leafhoppers.

They feed on the juice from the plants. Upon feeding, the disease transfers from the mouth of insect to the healthy plant, infecting it with the disease.

Pierce's Disease, affects the vascular system of the plant. It multiplies and houses in the xylem of the plant, which is a water system that is similar to piping. As I said is a slow process and difficult to discover until the plant has been infected for one year.

One good thing about PD, is that is does not affect humans in any way, nor does it affect the quality of the wine produced by these grape vines. It is however, responsible for the death of many grape vines throughout California and other wine producing areas.

The susceptible varieties and what to do to prevent PD infections

The only real combative measure against Pierce's Disease to date is to be attentive to your grape vines and plant varieties that are resistant to the disease. At this time, even with all the research, plant pathologists and scientists have not been able to produce a rootstock, spray, or solid practice that will prevent or reduce a PD infection.

The only real suggestion is to plant grape vine varieties that are resistant to the disease. Here are the resistant varieties:

Orlando Seedless – This is a table grape with great flavor and fairly easy to grow. It will need some pruning and thinning of clusters to maintain, but produces a great tasting wine. Not only is this variety resistant to PD, but also Powdery and Downy Mildew. It is susceptible to Anthracnose and Black Rot however.

Blanc duBois – This a variety of grape for white wines. There is no need for rootstock in most cases, and produces nice sized berries and clusters. As with Orlando Seedless, it is resistant to Downy Mildew and PD, but susceptible to instances of Anthracnose and Black Rot. This variety is not good for soils that are high in pH and poorly drained.

Other great resistant varieties include Black Spanish, a variety for jellies, juices, and red win, Champanel, a variety for red jelly, Favorite, a child of Black Spanish, and Roucaneuf, a table or white wine grape. As well as Herbemont, Norris, Stover, Lake Emeral, Conquistador, Suwannee, Daytona, Miss Blanc, Miss Blue, and Mid South, are all PD resistant varieties.
Overview

The best defense against Pierce's Disease at this time is to eliminate susceptible varieties and stick with those that have a known resistance, at least until someone develops a solid defense for other varieties.

Powdery Mildew (Odium tuckeri)

Wondering what the white powder-like mildew on grapes is? It is called oidium and it is caused by a fungus called Uncinula necator. This fungus only attacks grape plants and a few of their related species. It is safe to say that it is a widespread fungal disease that can cause total crop loss and or reduced fruit quality, wine quality and vine growth. Oidium's severity will vary from season to season but it does require treatment **each and every season**.

Symptoms: The disease is seen most easily on leaves. However, all green tissue is susceptible, especially when it is soft and juicy, and growing fast. Small white patches, 1 to 2 cm in diameter on the surface of green tissue. Many spores are produced on infected leaves and berries. Leaves look as though they have been dusted with a fine grey-white powder.

Grapes continued: Leaf stalks and bunch stems look scarred and stained. On infected green canes, the disease shows as a black web-like stain that turns red as the cane matures. Shoots may die back.

Flowers are also attacked and heavy infections reduce fruit set. If berries are infected before they reach full size, they stay small and often dry out. Some become covered with star-shaped scars that causes the berries to crack open as they grow. This allows other bunch rots to develop during wet weather.

The lateral shoots are incredibly susceptible to the fungus. The blossoms if infected may not turn to fruit. The berry is most susceptible to being infected in the first three to four weeks after bloom. The rest, though, the shoots, petioles and other parts are susceptible throughout the season.

If the infection takes place early, it can reduce the size of the berry and decrease the sugar content as well. You will also notice that the infected berries will have what appears to be a netlike pattern on them. They may crack open and dry up or just never ripen. On the canes, you can see old infections because they will show up as brown areas. As the fungus grows on the grapes and vines and begins to produce spores you will see that the tissue that is infected with have an ash grey powdery look.

Although a bit out of focus, you can clearly see the brown areas on the shoots and stems of the grapes

The organic grower has to take into consideration things such as: the location of the vineyard, design of vineyard, row orientation, choice of variety of grape (due to susceptibility factors), canopy structure, irrigation, water and nutrition and shoot removal done early in the season.

There are chemical treatments that can be used as well to help treat and get rid of the powdery mildew. The application of fungicides should start with early shoot growth and continue until bloom. It is important to establish good control early so that the disease is prevented from becoming the powdery mildew epidemic of the summer. Fungicides that are used most often include sulphur, Nova, Lance, Sovran, Flint or Milstop.

Applying a dormant spray of lime sulphur is very effective when it comes to suppressing any over wintering population of the mildew. Applying in the early spring before the buds break will kill the powdery mildew, covering any dormant vines is very important. Then there is the post-harvest spray that is also beneficial. The date of your harvest will help you determine the necessity to keep foliage and canes protected for as long as possible.

There are some cultivation methods that you can do to help control the disease and possibly prevent it from attacking your vines. Make sure that you are selecting proper rootstocks, training systems and fertility. Make sure that you are practicing timely sucker control. Cut the canes back close to the top wire of the trellises. Make sure that you are removing leaves so that bunch rot does not occur, this allows the fungicides to better cover the clusters. You can also choose one of the very few grapes that are not susceptible to this fungus. Grapes that are not susceptible are Auxerrois, Malvoisie, Melon, Pinot Gris and Semillon.

Choose carefully, plan wisely and spray at the appropriate times to make sure that the powdery mildew does not attack and destroy your crop.

BLACK ROT (Guignardia bidwellii)

Black rot is a devastating disease that can ruin your grape crop within a matter of days. Most commercial varieties are susceptible to grape black rot and therefore care should be taken to prevent this disease.

Symptoms of black rot first appear as small yellowish spots on the leaves of the grape vines.

When you look close enough at the yellow spots, you will see small black spots in the yellow spots. These are the fungal fruiting bodies.

The symptoms on the grapes are easy diagnosable. It starts out as small, round, black/brown spots on the fruit and softens as the tissue starts to rot and later mummifies.

Controlling black rot:

The most important aspect of controlling black rot is sanitation. If black rot was a problem in your vineyards this season, you should remove all pruned canes and left-overs of grapes that is found in the vineyards.

Once again, good airflow and proper sunlight penetration is of the utmost importance if you live in an area where black rot is a problem. All manipulations that will improve the airflow and sunlight penetration, will make your grape vines more resistant to this diseases.

Chemical control is also possible, however, chemical methods alone may not allow effective control. Organic options for black rot control include fixed copper or sulfur. Chemical methods include Ferbam, Mancozeb, or Captan. Be sure to read the product labels to see if it is registered in your state or country.

Erinose (Erenium Mite)

Erinose is caused by the Erenium Mite (Eriophyes vitis pgst) feeding on young grape vine leaves. These mites are microscopic in size and cannot be seen without a magnifying glass or microscpope.

The adults become active early spring and their feeding habits cause the upper side of leave to look bumpy (goals). On the bottom side of the leaf, opposite to the goal, a dense hairy area occurs, called the erinea.

The female mites lay their eggs in the erinia and the young feeds on the leaves from inside the erinia until they are mature enough.

Late summer, when little or no young leaves are available on the vines, they will crawl down to the bottom of the leaf stem and hide under the scale leaves of the buds (situated between the leaf petiole and the shoot itself) where they will hibernate.

Although this looks like a serious disease, it seldom influence crop quality or size, except if their numbers reach epidemic levels.

Control:

A proper sulfur dust application should control this disease and normally, if a powdery mildew program is followed, it will control Erinose as well.

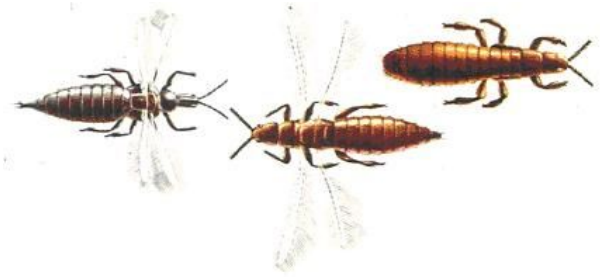
Chemically, a spray application with SUPER SIX®1 (Active Ingredient: 720 g/liter sulfur in the form of a suspension concentrate) at a rate of 200 ml / ha or 2.6 fluid ounces per acre should be enough to kill the mites.

On the top side of the leave

On the bottom side of the leave

Thrips:

There are several species of thrips that will attack a grape vine, but the most common one is the European Grape Trips.



The live cycle Thrips is very fast and 5 generations can be produced in a single growing season. Although very little damage to the leaves occurs, except with epidemic numbers, the damage from Thrips, cause silvery to corky scarring on the berries. Although this cosmetic damage does not harm the internal fruit quality, it can ruin crop if you grow table grapes and want to have good looking grapes.

The problem with Thrips is that they are most active during flowering of the grapes and because they are so small, they are not often seen. To check if your vines have thrips, simple put your hand around a flower bunches and with a gentle stroke pull your hand down the length of the bunch. If you open your hand you will see these very small insects that looks like the pictures above.

You can also monitor for Thrips by shaking flowers onto a sheet of paper and look for the insects. Adult thrips are attracted to bright colors and can also be monitored by randomly placing bright yellow sticky traps in your vineyard. The traps will attract the insects and then they will get stuck when they sit on sticky tape.

Control:

When you see the damage of thrips on the berries of the grapes, it is often too late to try and control this disease. An occurring spray program or proper monitoring your vineyard is the best way to go. Remember, if the cosmetic look of your grapes is not important, then most of the time thrips will not be a problem for you.

There are ways to biologically control Thrips. Just do a search on the internet to get more information on this.

Chemically, Thrips can be controlled by spraying a cover spray with

Imidacloprid	0.30 g/L
Clothianidin	0.12 g/L
Thiamethoxam	0.25 g/L
Lambda-cyhalothrin	0.50 ml/L
Spinosad	0.25 mL/L
Emamectin benzoate	0.20 g/mL/L

These are all insecticides, so make sure you read the labels for each product. Also take note of the withholding periods for these products!

during flowering and early berry development – **correct timing, and proper cover is the key here**.

Grape Mealybug:

Is a voracious pest that attacks a wide range of different host plants, including the grape vine. Serious crop losses can occur with this disease and proper care should be taken to prevent this disease. The grape mealybug can also vector the vine leafroll virus, which can have a great impact of vine and grape quality.

Mealybug females feed on plant sap, normally on the green shoots, but is found on grapes and roots as well. They attach themselves to the plant and secrete a powdery wax layer (therefore the name mealybug) used for protection while they suck the plant juices.

Control:
As the female mealybug feeds on the vines, they produce the wax layer (as mentioned above), this "honeydew" attracts ants which on the other side protects the mealybug from it natural enemies. Therefore, controlling ants will significantly reduce the numbers of mealybug in your vineyard.

The problem with chemical products that is registered for the control of mealybug, is that it also kills the natural enemies of the mealybug.

Biological control is possible – again search the internet for help on this, but I would recommend you first try and control the ants.

Chemically, a dormant spray on the framework of the vines with a Chlorpyrifos product will help control the spread of this disease –

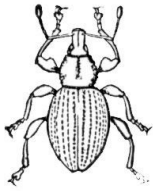
ENSURE IT IS REGESTERED IN YOUR STATE OR COUNTRY FIRST AND READ THE PRODUCT LABELS, IT HAS A LONG WITHOLDING PERIOD AS WELL.

There are herbal oil-based products on the market that was specially developed to control mealy bug on grapes and other fruit crops as well. Contact your local nursery to find out if it is available where you live.

Other grape growing problems which you may encounter

Weevils

Scientific Name: Phlyctinus callosus



The eggs are yellowish-white and stuck together in groups in secluded places. Larvae are arc-shaped, legless, creamy white, with brown heads. They grow to about 6 mm in length. Pupae are creamy-white and soft bodied.

The adult is usually the only stage seen. It is grayish-brown, 5-7 mm long, wingless, with a hard hump- back and characteristic elongation of the head to form a snout. The body is marked with a light- coloured V-shaped line across the rear of the back.

Damage: Typical symptoms are serrated edges and sometimes holes in the lower leaves of grapevines and trees.

When and where: Snout beetles emerge from the soil in the spring. They feed by night and hide by day in dark places under rough bark on vines and trees, between clusters of fruit or under litter and clods on the ground.

Control: Concentrate on the adult as it would be difficult to control those stages which the weevil spends underground. Two accepted methods of control: Firstly, one can use a active contact insecticide, spraying it on to the trunk and lower parts of the main branches. Secondly, using a contact and stomach insecticide, applied as a cover spray of the entire tree.

The problem with this pest is that it feeds at night and hides under the bark of the grape vine during daytime. You therefore need to do control early morning or after sunset. Pay close attention to newly planted grapes vines close to the ground; weevils just love them!

Bird damage on grapes:

I would like to talk about birds damaging (eating) your grapes. If you are like me, a true nature person, fond of all wild animals (birds included), it is hard not to hate these feathered friends when you are a serious grape grower.

All over the world, grape growers have problems with birds ruining grape crops and the extent of damage to crops, caused by birds of varying types is often significant. Birds damage grape crops by either pecking or consuming whole grapes from bunches.

The former feeding method causes secondary spoilage as bacteria, molds and insects attack the damaged berries, which may ruin an entire bunch , like in the picture below. Further more, in the table grape industry, which is my specialty by the way, grape bunch appearance is an important feature of the produce and even minimal feeding by birds cause cosmetic damage, making the fruit unsuitable for the export market.

Secondary infection because of bird damage

Now the Million Dollar Question is: “How can you prevent birds from damaging your grape cop?”

Studies showed that strategies to try and eliminate birds species, that damage grape crops have a poor record of success and the fact that environmental consciousness is on everybody’s mind these days (as it should be), makes killing these birds not an option anymore.
There are a few methods, you as a grape grower, can use to try to reduce damage to grape crops.

1. Bird Netting

Grape growers use bird netting to drape the grape vines with a special net developed to keep out birds. Although bird netting give some sort of protection, it is not fool proof. Draping the netting over grape vines is a time consuming job and no mechanical manipulations (like mechanical harvesting) can be done before the netting is removed again.

2. Propane Gas Cannon

The Propane Gas Cannon is a bird scarer, controlled by an electronic timer and 12V battery and create periodic load explosions in an effort to scare birds from the vineyards. These Cannons are quite costly and should be placed at strategic places throughout the vineyard. Some grape growers where I live tried to use these cannons, but it seems like birds become acclimated in time to new sounds introduced into the vineyard and tend to ignore the cannon shots after a while.

3. Visual Repellents

I’ve seen grape growers use shiny streamers and other shiny and fluttering objects like small mirrors hanging from strings, to repel birds, but as with the propane gas cannon, birds acclimate to these objects quickly. Some grape growers stretch plastic strings over the vineyard and these strings will vibrate in the wind and make a low irritation sound that could (notice I said “could”) repel unwanted birds.

4. Chemical Repellents

No proven chemical repellent (to my knowledge) has been successfully used in vineyards. Normally, the grapes are almost ready for harvest and applying chemicals to the grapes, could lead to artificial flavor to grapes and in the end to the wine - and it could be dangerous to humans! I do not recommend this!

Deer damage on grapes:

Problems with deer in vineyards is becoming a bigger problem year after year, since we all strive to preserve mother nature and all wildlife. On the other hand, as much as most of us love the wildlife and working outside, we also love our grape vines and anyone who is having problems with deer, rabbits and other leave eating animals in their vineyards, can tell you how much damage they can cause to new vines - even devastate a young vineyard.

Rock Dassie or Hyrax is a huge problem where I live, because my farm lies at the foot of the a big mountain range.

I once read an article about the proliferation of deer in North America because of the so called “Bambi Syndrome”. We all know the movie Bambi and how cute the little deer is and how his mother was killed by a hunter and the struggle to survive.

The result was, humans started preserving these deer at all cost and even lured them to their houses by feeding them. Unfortunately, more and more suburban home owners started having problems with deer destroying their gardens as their numbers increased dramatically.

The point is; no matter what your feelings about deer are, it is a fact that you can’t allow them in your vineyard as they will for sure damage the vines (especially when young). I think you will agree that if it wasn’t for the fact that deer devour young vines right down to the cuttings, it would actually be nice having them around!

So now what? You have problems with dear, but you also don’t want to loose deer?

There are a few other option available except stripping your dog from all it’s hair LOL

1. Fencing

Although the best way to keep deer out, it’s also the most expensive method as deer can jump as high as 8 feet you will need a fence of about 8 feet high. If your land (vineyard) is quite big, this method will cost you a significant amount of money, not to mention the labour involved.

2. Electric fences (single strand and multi-wire)

Electric fence is much cheaper than other styles of fencing and is much easier to setup as well. The only problem is the availability of power, but solar chargers are also available these days.

A single strand of wire is stretched 3 to 4 feet above the ground and supported with a non-conducting material poles. Once the deer touch the wire a non-lethal electric impulse will shock the deer and spook it.

Multi-wire electric fences is also used and is about 5 feet tall. A slanted support will stretch the wires at different angles which will confuse the depth perception of the animal. The deer can easily jump over the fence, but the angles of the wires confuse the deer as they approach to jump and will touch the electrified wires before they actually jump - clever hey?

3. Animal repellent sprays

Using repellents is another option you could consider. There are many products on the market but I've heard that some grape growers are skeptical to use these products as they are afraid that the smell and taste products could be picked up in fruit and wine in the end. There is however no proof (as far as I know) that this is the case. In fact, if your vines are still young, it won't bear any fruit so this is an option for young vineyards.

4. Egg spray or garlic juice

Although I never tried it myself, there are grape growers that claims to get great results from this method.

A mixture of 20% blended eggs and 80% water is sprayed on the vines. It is said that the eggs contains a sulfur compound that is chemically close the sent that alarms deer when they feed. If all fails, try this method.

5. Electronic Deer Repellers

I haven't tried out this method, but some gardeners have great success with this product. Simply place a few drops of the acorn scented deer lure onto a cotton ball and stake it in your yard. When the deer repellent is properly placed near a deer path, the lure will attract deer to the posts. Upon contact, the deer receive a gentle static shock (likened to static electric shock received from carpeting, etc.), conditioning them to stay away from your vineyard!

6. Hunting

For most people this is not an option (me as well, as I love wild animals). If you do decide to hunt the deer, just keep within the laws of your state or country.

Japanese Beetles:

The Japanese beetle (Popillia japonica, also known as the jitterbug) is one of the most visible and most destructive feeders of grape vine foliage out there.

The Japanese beetle attacks most green parts of the grape vine, but mostly feeds on young leaves in the upper part of the canopy. Occasionally, they will feed on fruit also, making it unusable for export or table grapes.

When Japanese beetles feed on the leaves of the grape vine, they will eat the foliage surface material between the veins, leaving only the veins in place, which will look like they were skeletonized. Although mature, vigorous growing grape vines can tolerate quite a bit of defoliation, this insect can cause some serious damage to a grape crop.

The life cycle of the Japanese beetle:

Japanese beetles overwinter as larvae in the soil. They will feed on the roots of grass and other plant material. Adult beetles will become visible in late spring and may be present in vineyards until mid summer. The adult Japanese beetle (as seen in the picture), has a distinctive, shiny green body and head, with copper-colored wings. The sides and back of the body is covered with small white hair. The female Japanese beetle is bigger than the male and is approximately ½ inch long.

After mating, the female Japanese beetle will temporarily leave the grape vine, to lay up to sixty eggs in the soil of your vineyard or if you have a backyard vineyard, in your lawn. In midsummer, the eggs will hatch and will reveal small, white grubs or larva, where they will feed and hide up to 8 inches deep into the soil, to wait out the cold of winter.

Japanese beetle control:

Strange enough, in Japan, where the Japanese beetle originally comes from, this insect is not a big problem! Why? The answer is; natural enemies that feed on the grubs.

For the organic grape grower, you can control Japanese beetle by putting out traps with a pheromone that attracts the female and a floral lure, that will attract the male. The disadvantage of using these traps are that you can lure more Japanese beetles to your vineyard, as they can fly quite long distances in a short amount of time.

A program with physical and biological control of the grubs is a more effective method of controlling Japanese beetle. The two nematodes that are most effective against Japanese beetle grubs are Steinernema glaseri and Heterorhabditis bacteriophora. Both these nematodes are commercially available.

Milky Spore (Bacillus popilliae), a naturally occurring host specific bacterium, will also attack the destructive white grubs.

Important: If you are to use chemicals to treat Japanese beetle, then spot treatments with botanical insecticides is advisable. Unfortunately, these chemicals also kill the biological nematodes that help control Japanese beetle. In other words; keep chemical treatments to the minimum. Products like Carbaryl, Malathion, Methoxychlor, Rotenone can be used on adults and Merit (turf), Marathon, Bendiocarb can be used to control grubs. Make sure these products are registered in your country or state before you use them and PLEASE, read the labels of the products BEFORE you use them.

Chapter 16
When are your grapes ready for harvesting

I am so pleased that you are reading this, because then you and I have succeeded in our goals. Mine was to teach you how to grow a grape vine – well, I hope are reading this because your grapes are almost ready to harvest.

Yours was to grow your grape vine so that you can have some grapes to harvest! One important thing to remember is that grapes do not ripen after it was cut of the vine (nonclimacteric), so you have to harvest when the grapes has optimum ripeness.

There are many factors that will influence the ripening of your grapes.

- How many grapes there are on the vine – the more grapes, the later you will harvest
- Climate conditions – Cold summers, will stretch out the ripening process of the grapes
- Soil type – more clayish soils, tend to be later than say sandy soils
- Virus infected vines – one of the symptoms of a virus infected vine can be that the harvest date will be a bit later.
- Certain varieties are harvested earlier than others – see the variety page for more detail

Many home growers make the mistake of thinking the grapes are ready for harvest when it start to colour. The colouring of the skin is a good indication that the grapes are nearly ripe enough to harvest, but not ready yet.

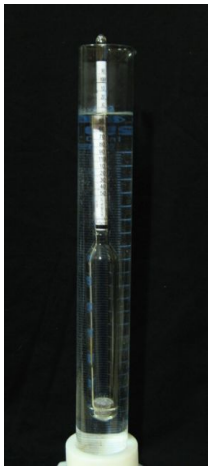
The ripeness of grapes is measured in Degrees Brix (symbol °Bx). This is a measurement of the mass ratio of dissolved sugar to water in a liquid. A 25 °Bx solution is 25% (w/w), with 25 grams of sugar per 100 grams of solution. Or, to put it another way, there are 25 grams of sucrose sugar and 75 grams of water in the 100 grams of solution.

There is an instrument called a refractometer, that measures the sugar levels of the juice squeezed from a few berries. This instrument unfortunately is quite expensive and only if you plan to make your own wine, I would recommend buying one.

Just press out the sap from the berry onto the prism and look through the scope to see what the Brix reading for your grapes is.

In this picture can see that the Brix reading is almost 18 °Bx. For table grapes, these grapes are ready for harvest. For wine grapes, we normally wait until the Brix reading is about 21 °Bx or higher.

A less expensive means is to use a hygrometer. You need at least 50 berries to determine the sugar content by this method though. The hygrometer is floated in the grape juice obtained by squeezing the berries and the sugar content is read off the scale on the hygrometer.



A titration can also be used to determine the ripeness of grapes, but this is more for the science guru's out there.

One of the best ways to determine the ripeness of your grapes is by tasting them yourself. Don't pick a whole bunch, pick only 2 – 3 berries from the top and the bottom of the bunch. You will notice that the berries at the top of the bunch ripens a bit earlier than the bottom ones.

Chapter 17
The (huge) list of grape varieties

Choosing The Correct Grape Variety

Choosing the correct grape variety is one of the most important decisions any home grape grower needs to take, when it comes to growing grapes. The correct variety will stand between being a successful grape grower or failure.

In the early days, choosing a grape vine variety that suits your climate, soil and growing conditions, was much harder than today. Nowadays, with more than 20 000 known grape varieties in the world, people living in climates, previously deemed unsuitable for growing grapes, can now plant varieties that was specially bred for to survive in harsh grape growing conditions.

Backyard grape growing is becoming more and more popular by the day, as people more and more strive to live healthier and look after our planet more carefully. Unfortunately, you cannot just plant any grape vine in your backyard. You will have to do some research on what varieties suits your climate, your soil and the availability of good quality water.

Another major concern for any home grape grower is a disease called Phylloxera. In the late 1800's, a Phylloxera epidemic (a sap-sucking insect that feeds on the roots of the grape vine) destroyed more than two thirds of all the vineyards in Europe. The breeding of Phylloxera resistant/tolerant rootstock, prevented this disease from killing all grape vines. Planting grafted varieties is the preferred method today, because the rootstock does not interfere with the development of the grapes.

When choosing the correct grape variety, it is best to visit vineyards in your area and see what varieties are successfully grown there. Most of the time, this is a surefire way of knowing that you have chosen the right variety.

Cold damage to grape vines is another grape growing obstacle that will influence the choice of grape varieties. If cold damage is a problem where you live, choose a variety with a short growing season, so the grape vines have enough time to harden off before winter comes.

A final word of advice; if nobody grow grapes in your area, it doesn't mean grapes can't be grown there. Do some research and choose wisely. There is nothing more satisfying than enjoying grapes, grown on your own grape vine and prepared by your hands.

As you can see in the list below, there are "zillions" of different varieties available! It is unfortunate that these varieties have different characteristics and cultivation practices to produce export quality grapes.

The highlighted varieties just below, is grown on my farm or which I can give you information on – this will be very, very exclusive advice how to cultivate them to get the best results.

The most popular seedless grape known in the United States is 'Thompson Seedless', but was originally known as 'Sultana'. It is believed to be of ancient origin. It is considered a white grape, but is actually a pale green.

Other white varieties are 'Perlette', 'Menindee Seedless', 'Interlaken', 'Himrod', 'Romulus', 'Lakemont' and 'Remailey Seedless.'

The most popular red seedless in the U.S. is 'Flame Seedless'.

Other red varieties are 'Crimson Seedless', 'Ruby Seedless', 'Suffolk Red', 'Saturn' and 'Pink Reliance'.

Some black varieties are 'Black Beauty', 'Black Monukka', 'Concord Seedless', 'Glenora' and 'Thomcord.'

Here is a link to a web site where you can find more information on all of these varieties.

As you can expect, I will not bore you with all of these details, so go and have a look yourself if you have something in mind.

Happy searching.

Chapter 18
Closing Words

We have come to the end of this grape growing course. I hope you have learned some new things about the art of growing grapes.

If something in this e-book is not clear, or if you have any questions or need some specific help, just shoot me an email at support@my-grape-vine.com

Once again, thanks for purchasing this product.

Take care of your vine and it will take care of you...

Happy grape growing my friend!

Danie Wium
"The Grape Guy"

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