Planting and Management of Young Vines

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Introduction
The process of planting and managing young vines is critical to the success of any development or redevelopment program. The way a vine is planted and maintained for 12 months after planting will determine how soon it will begin to crop and to some extent how productive it will be for a considerable time into the future. Thus it is important to ensure that both tasks are carried out correctly.

While neither planting nor management are particularly difficult tasks, they are time-consuming and it is easy to pay inadequate attention to either task, particularly management. Weather conditions and irrigation system constraints may also make management difficult.

Planting
There are a number of different methods for planting young vines, with the most suitable method depending on factors such as the number of vines to be planted, soil type and whether it is a new development or a replant situation.

If it is a new development or planting into cleared ground, it is important to accurately measure out the rows and make sure that they are straight. Later on this will help to improve the efficiency of mechanical harvesting and reduce stress on trellises.

Cuttings, rootlings or graftings?
In some situations vineyards have been established through the planting of cuttings. While developing vineyards in this manner can sometimes be successful, the planting of rootlings is certainly preferred. There are plenty of examples of failures where cuttings have been used mainly due to a poor strike rate, requiring extensive replanting and leading to a vineyard with uneven growth. The use of callused cuttings for direct planting will help to obtain a higher strike, however, planting a small nursery at the same time for replants may be advisable.

It is worth noting that if cuttings are used, planting will usually be much quicker.

Planting methods
A number of methods are available to plant vines, including the shovel, vine planters, auger and water jet. A summary of the advantages and disadvantages of each method follows:

Shovel: A shovel can easily be used to vary hole depth and width to suit the rootling, but is slow and should only be contemplated if small areas are going to be planted. Take care to roughen the sides of the hole before planting to reduce the smearing effect caused by the shovel. Rougher sides will allow roots to grow out evenly and eliminate root binding effects.

Vine planter: This is towed behind a tractor and consists of a winged ripper followed by a pair of blades (a bit like a furrowing out machine), followed by press wheels to compact the soil around the vine. Vine planters are useful where large areas need to be planted.

Auger: Augers only work well in soil types that do not smear badly. Heavier soils can be a real problem. Often an auger mounted to a silly plough is a good method of inter-planting into older vineyards being rejuvenated or to replace misses.

Water jet: This is probably the most commonly used planting method. Water jets are good because they plant the vine into already moist soil. In heavy soils more effort will be required to gouge a suitably sized hole for the young vine. In lighter soils care has to be taken not to jet too deep a hole. Don't skimp with water. Using additional water will ensure proper consolidation of the soil around the vine after planting. When using a water jet it is most important to point the roots downwards and outwards in the hole when planting.

Regardless of the planting method used, it is important to ensure that the soil is properly back-filled and compacted around the roots, that no air pockets remain and vines are well watered in.

Rootlings should be kept moist from the time of removal from the nursery up until the time of planting. Drying out of young vines at this stage is one of the biggest causes of death of a newly planted vine. Keeping rootlings bundled under a moist hessian bag is one good way of keeping roots moist prior to planting. Rootlings being planted directly out of plastic tubes will avoid potential drying out problems. If it is not a biodegradable tube, remove the container, leave the potted soil intact around the roots and lightly tease compact soil/roots before planting.

Generally roots will need to be trimmed prior to planting. Don't over-trim the roots (i.e. make sure that the minimum amount of root material is removed before planting). Make sure that the main roots are well spread out and placed downwards.

For own-rooted vines, plant the vine deeply to avoid damage from cultivation and reduce drying out of the roots between irrigations. Cut the top growth back to about two buds (five in frost-prone areas) and leave a small stub to attach the training string.

For grafted vines it is essential that the graft union is not covered by soil otherwise roots will develop from the scion wood.

Time of planting
The ideal time to plant young vines is late winter or spring. Early planting will maximise the growing time available for the vine, but on heavier, poorly drained soils this can be a disadvantage due to root rot infections.

Vines can be planted up to the end of October in Sunraysia, however planting by the end of September is preferred. Beyond September success rates will start to decrease with the increasingly hot weather (see also Davidson 1995, in this Proceedings).

It is best to plant cuttings in warm ground, especially Ramsey, to enable good strike.

One problem with early planting is that the simple methods of weed control such as complete cultivation or the use of a wide range of herbicides have to be modified and substituted with practices which are constrained by the need to prevent off-target damage.
**Care of young vines**

Once a vine has been planted, it is essential that it is properly looked after. The labour requirements of even a relatively small patch of young vines are considerable and this should not be overlooked when planning a development.

**Irrigation**

Proper irrigation management is critical to ensure the survival and rapid growth of a young vine. The same basic principles which apply to established vines are used with young vines, namely to keep the soil moist at all times, however, some modifications to scheduling will be required due to the size of the root system, type of irrigation system and availability of a water supply.

A recently-planted vine has a very small root system which only requires a small amount of water, but conversely cannot last for very long between waterings, particularly during hot, dry weather. Poor irrigation management was one of the reasons for the higher losses of young vines in the 1994/5 season.

If a water jet has not been used for planting, the young vine should be watered thoroughly. Thereafter irrigations will be required frequently, up to weekly in extreme circumstances. Private diverters and those with on-farm water storage are at a considerable advantage over irrigators in pumped districts.

The relative advantages and disadvantages of the different types of irrigation systems can be summarised as follows:

- **Furrow:** Least flexible system, generally delivers too much water, wets non-target soil, allows substantial weed growth, lessens access—this can be improved by putting basins around vines.
- **Overhead and low level sprinklers:** Can accurately deliver required amount of water, but still wet non-target soil.
- **Drip:** Can deliver required amount and target only the root zone. Fertilisers can also be targeted through a drip system.

**Nutrition**

A application of appropriate nutrients at the correct rate will assist with rapid shoot growth and development of a young vine. As was the case with irrigation management, the small root zone means that careful targeting of fertilisers will be required. Nitrogen fertilizer can also be used at this stage without any of the problems seen in older vines with excessive vigour.

Nitrogen applications into the planting hole or furrow are not recommended as most of the nitrogen will be lost. Two to three side dressings of a nitrogen-containing fertiliser such as urea during the growing season is the best application method. Don’t over-apply and don’t apply too early. Keep urea at least 150 mm away from the butt of the vine to avoid burn and preferably apply urea to moist soil.

Superphosphate is usually incorporated into the soil before planting and this is the preferred method, however it can also be placed into the planting hole or furrow just before planting. If this is done make sure that the fertiliser is applied deep enough to avoid any problems with burn.

Certain soils may also be deficient in a range of micro-nutrients such as zinc, boron, manganese or iron, and a fertiliser program may need to be developed to incorporate micro-nutrients if necessary. Knowledge of local conditions will assist decision making in this regard. Further it is important to remember that nitrogen fertilizers can significantly affect soil pH in some soils resulting in large increases in acidity, particularly with drip irrigation.

**Weed control**

Conditions which promote optimum growth of young vines—basically moist warm soils and access to sufficient nutrients—will also prove to be ideal conditions for growth of a wide range of weeds. Vine growth will be severely reduced if weeds are not adequately controlled.

The first step towards good weed control begins before the vine is planted, with the use of either cultivation or herbicides to make sure that the under-vine area is free of weeds. Once the vines have been planted, weed control becomes more difficult. Ongoing weed control will then entail use of herbicides, cultivation, or most commonly a combination of both.

**Undervine control:** A planting that has been controlled prior to planting, a suitable pre-emergent herbicide such as Surflan® can be sprayed over the top of the vine after planting provided sufficient water is applied (rainfall or sprinkler) to achieve incorporation of the product. Knockdown herbicides such as Sprayseed® can be used later in the growing season, but extreme care needs to be taken to avoid drift onto any part of the vine. Grass weeds can be controlled by the use of herbicides such as Fusilade®.

If cultivation is to be used, the most common form is knifing the under-vine bank which can be effective in certain situations. Problem weeds such as couch will be difficult to control in this manner. Be careful not to knife too deeply as it is easy to damage the root system. For this reason it is advisable to ‘throw on’ an under-vine bank, to provide a buffer zone for weed growth above the vine’s main root zone.

Inter-row control: This is particularly critical in terms of hindering vine growth and in fact, provided that frost is not a problem, it is preferable to grow a permanent cover crop in the inter-row area to improve soil structure, help reduce wind damage, soak up excess moisture and improve vineyard access in wet weather.

**Guards**

The succulent new growth of a young grapevine is particularly tempting to a range of vermin, particularly rabbits. Hares on the other hand tend to chew the bark and ring-bark the vine. Depending on the location of the vineyard, control measures may need to be quite extensive and expensive.

For a vineyard located in a high damage area (i.e. adjacent to scrub or broad-acre farms) it may be easiest to fence the whole planting or run a control program. Alternatively individual guards can be used, usually made from wire, card-board or plastic.

Plastic tubes are also used as vine guards but will provide protection from vermin. Their main purpose is to assist in providing a good microclimate for growth, training foliage upwards and allowing greater flexibility in the use of herbicides. Careful management is required if plastic tubes are used as foliage can easily be burnt or damaged from rubbing by the plastic due to wind. Stapling the tube to the training string will help to reduce this problem. Problems with fusarium rot have been experienced with plastic tubes.

New developments are being experimented with. This includes innovations such as the use of non-ultra violet...
Disadvantages of each method

Sprawl
- Relatively high pruning costs - minor compared to training costs.
- Poor machinery access in narrow rows, together with leaves in the inter-rows, which results in difficult pest control.
- Probable root damage in Piccadilly due to the combination of wind and soil causing ‘vine gyration’.
- There is no chance of a crop in the second season.

Pinch tip
- High labour costs due to the time and the skill levels required.
- Restricted root growth due to the small number of leaves produced.
- Restricted root growth due to the loss of 3–4 weeks growth due to the loss of the apical tip.

T & T
- Higher pruning costs - small but significant cost.
- Pest control can be a bit more expensive due to the dense canopy.
- To many eyes the vineyard will not look tidy.

Summary
In our area and under our management system, the T & T method will give best root growth, has the greatest chance of an early crop and has reasonable training and pest control costs. A round Piccadilly we have vineyards that have never really cropped well and they are usually vineyards that grew poorly when young. We also have vineyards which crop well almost every year and they are generally vineyards that grew strongly when they were young. Perhaps this is a result of how much of the shattered soil volume is filled by the young vine roots in the first season before the soil settles again.

The viability of grape growing in cool climates is marginal. It is quite probable that a vineyard that does not grow strongly in its first season may never be a profitable investment.

Training
Once a vine has been planted and has begun to grow actively, attention needs to be paid to the task of training it up to the wire. There are basically two alternatives, letting the vine sprawl for the first year, or training to the wire as soon as possible.

Sprawl: If this procedure is used, the strongest shoot is retained in the following season and pruned to two nodes. All other shoots are removed. Form the trunk from the strongest and best angled shoot that develops in the second season. The advantages of this system are that the increased vigour from second year growth ensures a stronger, straighter trunk, less disbudding is required, most vines will reach the wire in the second year resulting in a more uniform planting.

First year training: Provided vines are sufficiently vigorous—which rootstocks usually are—this is the technique preferred by most growers. It requires more intensive training and disbudding but these costs are more than offset by the earlier cash return generated.

When training remember to select the most vigorous shoot to form the trunk (provided it is in a suitable position) and make sure that the string does not strangle the young vine, a particular problem with rootstocks. A wire loop placed in the ground beside the vine is a good option to avoid this problem. There are also commercial ground anchor devices available.

Conclusion
The operations of vine planting and management are critical to achieving the maximum yields from a vineyard. There are a number of discrete tasks which must be successfully completed if the vine is to grow rapidly in its early stages and neglecting any of the tasks will reduce vine performance. Management of young vines is time consuming, so make sure sufficient time is planned for to get it right.

Reference