Benefits and pitfalls of field grafting winegrapes – Part 1

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The 2013 grafting season saw unprecedented demand for providers of field grafting services. In this two-part article, Tony Hoare draws on his extensive field-grafting experience to offer some comprehensive advice on whether the practice should be undertaken in the first place and how to get the best results. In Part 1, Tony dispels some grafting myths, explores the reasons why grafting over vines might be considered and the pros and cons of the practice versus new plantings. The second article, to be published in the May-June issue of the Wine & Viticulture Journal, will look at the risks to success of field grafting and proposes a timetable for post-grafting management.

Field grafting, also referred to as top working, has been in high demand in recent years as growers change varieties to keep up with market trends. Grafting over to new varieties or clones is a viable option for many Australian vineyards. The 2013 grafting season saw unprecedented demand for field grafting providers like me. While grafting works in most situations, there are many factors that growers need to be aware of before committing to reworking their vineyards.

Before you graft, there are quite a few misbeliefs surrounding grafting which need to be dispelled.

Grafted vines don’t last as long as a new planting

From my experience, there is no evidence to suggest this theory is true. The proof is in the fact that many grafted vineyards are still producing 20-30 years after grafting.

Grafted vines don’t produce quality winegrapes

Grafted vines may, in fact, produce higher quality winegrapes faster than newly-planted vines. Grafted vines have an established root system that has a greater interaction with the soil for nutritional requirements as well as a greater access to soil moisture, therefore, a greater resilience to extreme heat conditions. I have seen a low quality Merlot vineyard produce high quality Shiraz a few seasons after grafting.

Grafted vines have high vigour and are prone to long internode spacing

Vine vigour is site specific and it is difficult to generalise. If grafting a vigorous variety onto a vigorous rootstock, then a high vigour response is possible. Conversely, a balanced vine can be achieved when grafting a low vigour scion onto a high vigour rootstock. Vineyard management inputs are also critical in regulating vigour. On the whole, most of the vines I have grafted seem to have a natural balance of vigour in the first season which allows for well-spaced internodes and the establishment of spur positions for the following season.

Grafting is like getting on board a merry-go-round - if you rework, your variety will come back into demand as soon as you graft onto something else

Any grafting decision should be based on your ability to sell the fruit. Some growers receive requests from wineries to graft over unwanted varieties which allows wineries the flexibility to release themselves from agreements that may be untenable. There are growers who are brave enough to predict the trends and graft ahead of the status quo. I have known winery-owned vineyards to fine-tune their varieties to add new clones of the same variety for some variation in the winery. The current trend is to replace...
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**Early season is the best time to graft, otherwise the grafted shoots won’t fill the cordon wire**

This is a widely held belief regarding the timing of grafting, however the opposite is true. The grafting season can begin as early as late August and can run into January with successful strike rates. Depending on the region, mid season to late season has the warmer weather with greater humidity, both of which are factors that enhance vine growth, callusing and strike rates. Cooler weather early in the season has led to failures in strike rates which can only be attributed to low humidity, ambient temperature, cold, moist soils all of which reduce a vine’s growth rate.

When preparing the trunks for grafting, leaving a head of foliage is better than cutting off all buds only to leave the trunk

From my experience, this is true for some varieties and in some vineyards. Leaving a few spurs at the top of the trunk is beneficial to the grafting success rate. Semillon is one such variety, as are varieties planted on deep sandy sites and some cool climate/low humidity vineyard microclimates. But, of the majority of successful grafting situations that I have been associated with, the entire cordon has been removed. This is the most economical way for the grower to prepare the trunk for grafting. Watershoots always appear and need to be managed so there is no benefit in most vineyards in leaving the ‘head’ on the vine trunk. The wound of the trunk should be treated with a wound seal as soon as possible, before any rainfall or dew can settle on the trunk. This will provide protection from Eutypa.

**WHY CONSIDER GRAFTING?**

**Non-profitable vineyard – unsuitable variety/clone/yield for current market demand**

There are market cycles of consumer demand for particular varieties. Poor market demand for the variety, over supply of the variety, low fruit quality, low yield, inadequate vineyard management, etc., can result in what I term a ‘low value’ variety. Low value varieties that are not profitable should be looked at for reworking if it is decided that the variety is unlikely to recover in value and profitability. Some growers remember the vine pull when old vine Shiraz was considered low value and pulled out. Years later, those that didn’t were able to capitalise on having these vines when market demand returned. Whether to persist with a variety or convert is an easier decision now with a more stable market and defined varietal preferences for most Australian wine regions. The benefit of grafting is that the old variety is retained as a rootstock and in most situations can be returned to that variety within one season if required. Most rootstocks that we graft are low value varieties that have fallen out of favour with wineries. Varieties such as Chardonnay and Merlot make good rootstocks for higher value varieties such as Shiraz and Cabernet Sauvignon.

**Poorly-trained vineyard – bent trunks**

Cutting off trunks prior to grafting can repair bent trunks by creating a new trunk with the grafted buds. Bent trunks pose problems for vineyard machinery and have an unsightly appearance. With most varieties, cutting off trunks alone will promote watershoots to burst and these can be trained up as a new trunk. Some varieties such as Cabernet Sauvignon have been known not to produce watershoots. If the watershoots do not grow, then the trunk usually dies that season. Grafting can provide the insurance that the trunks will have a viable bud to burst and also allows for a uniform trunk height.

**Eutypa – loss of spurs on cordons from Eutypa; reduced fruitfulness**

Cutting off infected wood into healthy wood is a management option for reinvigorating Eutypa-infected vines. As with rectifying bent trunks, grafting a bud into the healthy trunk will provide added insurance that a bud will be able to burst and keep the trunk alive. Grafted vines have a tendency to be more fruitful than older cordons in the first few years after grafting and are a good way to freshen up fruiting wood and lift yield.

**Vineyard infrastructure is sound, e.g., trellis posts wire, irrigation system**

If vineyard infrastructure is in need of replacement, then replanting is most likely more cost effective than grafting. To remove the cordons for grafting can cost as little as $0.08/vine when done with a mechanical mulcher. Removing a complete vine is more expensive, therefore, if the vineyard infrastructure is in good condition, it is more cost effective to graft than replant.
Grafting onto an established trunk and root system allows for a saving in water when compared with planting a new vine or irrigating a yielding vine.

Less than 5% vine misses from original planting
Uniform vineyards with well-trained vines and healthy trunks are ideal for grafting. If a vineyard has a high percentage of 'gaps' or 'misses' where vines have not grown, then it may be a better option to replant and have a more uniform vineyard in the future.

Expensive water – save water in the first season and the high water use in new vines
The cost of water and power have become significant factors in the profitability of vineyards in recent years. A newly-planted vine requires regular irrigation to achieve growth during the first few years of establishment. Irrigation during dry weather needs to be delivered close to a young vine as the root system has a small surface area and the vine’s growth rate is directly related to soil moisture. Grafting onto an established trunk and root system allows for a saving in water when compared with planting a new vine or irrigating a yielding vine. The water requirement of a grafted vine is reduced in the first season as the vine is not bearing fruit. It is important to note that a grafted vine does still require water for healthy growth and that the success of grafting and filling the fruiting wire in the first season is directly related to soil moisture availability to the vine. The first crop after grafting is also directly related to how well vines are managed with soil moisture in the first season of grafting.

FIELD GRAFTING VERSUS NEW PLANTING

There are some benefits to consider when comparing grafting to replanting vineyards:

• Grafted vines have established root systems that allow for rapid establishment with less water.
• Grafted vines can yield a full crop the first year after grafting; this may take up to five years with a newly-planted vine.
• Weediciding grafted vines is possible without vine guards and potential spray drift damage to vines compared with new plantings.
• The risk of vine loss through pest and disease damage and extreme weather is lessened with grafted vines as they are more resilient than newly-planted vines and vegetative growth is up in the fruiting wire away from chewing pests that can damage new plantings. Grafted vines are easier to spray when trained along the cordon wire.
• Grafted vines can be machine harvested in most instances the first year after grafting which is a significant cost saving compared with hand picking young vines.

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