Quality Planting Material: Objectives for Successful Nursery Operators

KYLIE McINTYRE
Viticulturist and Nursery Manager, S. Smith & Son, Yalumba Winery, Angaston SA 5353

Introduction
With the current expansion of Australia’s wine grape production resources in mind, it is particularly timely to consider the quality of grapevine planting material being used. It is also a good opportunity to discuss some of the developments occurring in vine accreditation and how they will affect your vineyards into the next century.

To explain the accreditation scheme very briefly, it is currently being developed on the initiative of industry and involves representatives from federal and state governments, the wine industry and vine improvement and nursery groups.

The primary aims of the scheme are firstly to provide industry with a predictable and reliable supply of high quality planting material which is of a verified origin and has a known disease status, and also to prevent disease and pest dissemination.

The group has concentrated on three main areas:
1. vine improvement, which concerns the registered cuttings used in propagation
2. vine propagation and nursery practice, and
3. hygiene and sanitation.

I will outline what I feel are the main factors contributing to vine quality, then briefly discuss how the proposed accreditation scheme will improve the quality of vines being planted in Australian vineyards.

What is quality?
Plant quality is more than simply the physical size of the vine. The first criterion for quality is trueness-to-type, that is, the nursery should be able to confidently state that the vine is of the variety given on the label. I do not have to describe the frustrations caused by off-type vines, particularly if they are not noticed until the first year of production.

The clone should also be known. Of course in practice for many wine grape varieties there is little difference in performance between the commonly used recommended clones. A list, we have currently no practical or economical method of identifying separate clones, as leaf and bunch characteristics are too similar. Notwithstanding all this, it is still important for growers to know what clone they have in the vineyard, because we are continually learning more about the virus status of our clones and how viruses can affect yield and vine growth.

If the vines are grafted it is most essential that the nursery supplies correctly identified material. The repercussions here are obvious; for example, more vigorous and higher yielding rootstocks will generally ripen later and some rootstocks are not resistant to certain soil pathogens.

The size and strength of the plant are also important. A larger vine with thicker and longer shoots will have a greater supply of carbohydrate and nitrogen stored in the stem. A vine with several strong roots evenly distributed around the base will establish more easily and quickly than a weaker vine and will be better able to withstand harsh environmental conditions.

If the vine is grafted it is most important to check the graft union by firmly pressing against the scion. Often the union appears visually complete but in fact is only on one side of the vine. An incomplete union will often break when the vines are being handled at planting or later when the string is attached for training. Machine harvesting young vines can also break incomplete graft unions.

Hygiene is the third component of quality to which the nursery must give consideration. Whether container-grown or field-grown, propagated grapevines can and have, on many occasions and in many parts of the world, spread devastating pests and diseases, most importantly phylloxera but also nematodes, viruses and root-rotting fungi. While many diseases such as crown gall and viruses originate from the cuttings and are brought into the nursery from external sources, the nursery operator should endeavour to prevent further spread and cross-contamination and where possible to eradicate the disease. This involves such measures as heat treating cuttings for crown gall, sterilizing tools between use with different varieties, pasteurizing potting media and heat treating dormant vines prior to sale.

A further component of vine quality for which the nursery operator is responsible is correct labelling and storage of the plants prior to collection by the customer. The vines should be clearly labelled with variety, clone and rootstock and should be stored so as to avoid both dehydration and rotting.

A further aspect of nursery management which I regard as a component of quality is customer service. This includes reliability of supply; in other words if there is going to be a shortfall—which there inevitably will be sometimes due to weather conditions or disease—it is important to give the customer early warning. This way vines can be sourced elsewhere, or the grower may be able to delay grubbing out old vines until the following season.

Even after the vines are despatched and planted nursery operators can still contribute to the quality image of their product by following up any complaints which will also inevitably occur. It is worthwhile visiting the vineyard and assessing the problem. In our experience poor growth is often caused by too much or not enough soil moisture, damage to roots at planting if vines were heeled in and root growth has occurred, or by weed competition.

How will the Vine Accreditation Scheme improve plant quality?
Firstly the scheme will identify the sources of cuttings used for propagation.

Germplasm blocks are the collection of originally imported or selected vines, usually held by the Departments of Agriculture or the Vine Improvement organizations. Class A blocks, sourced from germplasm plantings, are the intended sources of propagating material and should be inspected periodically for trueness-to-type and disease.

Class B vineyards are propagated directly from Class A blocks and must be on their own roots for cuttings to be taken for propagation. In years of normal demand material from Class B blocks would not be used, but in years like this where demand for cuttings far exceeds supply propagators will need to use ‘best available’ material. Provided that the origin can
be verified and that the blocks have been inspected for trueness-to-type when still in leaf. Class B material can be considered accredited.

Class C vineyards are normal growers’ vineyards which, according to the scheme, should not be used for propagation by accredited nurseries.

Some protocols have been recommended for vine improvement organizations regarding cutting collection and processing. Without going into detail, these will ensure that trueness-to-type and health status can be guaranteed to the purchaser. This is the first step in ensuring trueness-to-type of the finished product. If nurseries can be sure of the cuttings they are using, all that remains is for nursery operators to have an audit trail in place so that the movement of cuttings from the vine improvement organization through the nursery and out into the vineyard can be traced.

This is one of the recommendations for nursery practice under the scheme. Other key elements are that nurseries should preferentially use cuttings from the vine improvement schemes because there will be a guarantee of trueness-to-type. Also, heat treatment for crown gall, nematodes and rootborne pathogens is recommended, and accredited nurseries will be inspected periodically for hygiene and general practices. Standards for grapevine plants and a uniform system of labelling which gives the customer full information on the vine’s origin will be recommended.

The accreditation scheme is not yet in place and decisions on how it is to be administered and details on inspections have not been finalized, although it appears that the Australian Vine Improvement Association may in fact manage the scheme. Once in place nurseries can apply for accreditation, which will no doubt confer some marketing advantages.

To summarize progress so far, a national vine accreditation scheme is being developed and so far it has been fully supported by vine improvement organizations, nurseries and wine industry groups alike.

Growers purchasing vines from accredited nurseries will benefit because they will be able to have confidence that what they have planted is what they thought they had planted. They will be assured that the material is of a recognized standard and that it will not be introducing disease into the vineyard.

Finally, the scheme will give a huge advantage to the Australian wine industry by ensuring a reliable supply of quality planting material for wine grape production into the twenty-first century.

MAY: continued from page 43

or to be avoided. Nine rootstocks are included in the list of suitable rootstocks (Ramsey, 5 BB, Teleki 5C, Teleki 5A, Freedom, 1202 C, Schwarzmilch, 140 Ru and 99 R) while eight cultivars (Rupestris du Lot, K51-32, K51-40, Harmony, 1613 C, 420 A, ARG1, and 110 R) are considered to be less desirable (Buchanan and Whiting 1991). Information is given to match rootstocks and growing conditions; this will be described in more detail in the review paper (MAY, in preparation) on which this report is based.

For South Australia, Nicholas (1993) proposes Ramsey, 140 Ru, K51-40 and 101-14, listed in order of decreasing vigour, for the Murray Valley Irrigation Areas and Cirami (1992) suggests K51-40, 99 R, 110 R, 140 Ru, Teleki 5C and perhaps also 1103 P, SO 4 and 101-14 for the cooler part of the State.

NSW has so far little experience with rootstocks other than Ramsey. There, as everywhere else, this rootstock should not be used for scion varieties of the Muscat family, in particular Muscat Gordo Blanco, because of the incidence of scion/rootstock incompatibility.

Conclusions

The review paper in preparation (MAY, unpublished) will discuss in more detail the problem of rootstock selection with respect to phylloxera, nematodes, scion/rootstock incompatibility, soil type, uptake of mineral salts (potassium, chloride, iron and others) and water relations. It will also survey problems of rootstock physiology as they relate to the root system and to the influence of the rootstock on the vegetative and reproductive growth of the scion. Finally some questions of rootstock propagation and the production of grafted vines will be discussed.

It is concluded that despite the enormous amount of experimental work and the vast experience gathered in overseas countries on the use of rootstocks, and despite the many experiments done in Australia, there is still no clarity on which is the most appropriate rootstock for a given site. However it has been established with some certainty which rootstocks should not be used in a given situation and why they may be unsuitable. The choice of ‘the most suitable’ rootstock may not be possible until we know much more about rootstock physiology, i.e. the way in which rootstocks interact with the soil environment on the one hand and with their scion on the other hand. In any case it may be that too much emphasis is given to the need to choose a single, ‘most suitable’ rootstock for a given site because several stocks may give similar results.

References


