

Wine grapes information kit

Reprint – information current in 1997



REPRINT INFORMATION – PLEASE READ!

For updated information please call 13 25 23 or visit the website www.deedi.qld.gov.au

This publication has been reprinted as a digital book without any changes to the content published in 1997. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research:

- Chemical recommendations—check with an agronomist or Infopest www.infopest.qld.gov.au
- Financial information—costs and returns listed in this publication are out of date. Please contact an adviser or industry body to assist with identifying more current figures.
- Varieties—new varieties are likely to be available and some older varieties may no longer be recommended. Check with an agronomist, call the Business Information Centre on 13 25 23, visit our website www.deedi.qld.gov.au or contact the industry body.
- Contacts—many of the contact details may have changed and there could be several new contacts available. The industry organisation may be able to assist you to find the information or services you require.
- Organisation names—most government agencies referred to in this publication have had name changes. Contact the Business Information Centre on 13 25 23 or the industry organisation to find out the current name and contact details for these agencies.
- Additional information—many other sources of information are now available for each crop. Contact an agronomist, Business Information Centre on 13 25 23 or the industry organisation for other suggested reading.

Even with these limitations we believe this information kit provides important and valuable information for intending and existing growers.

This publication was last revised in 1997. The information is not current and the accuracy of the information cannot be guaranteed by the State of Queensland.

This information has been made available to assist users to identify issues involved in wine grape production. This information is not to be used or relied upon by users for any purpose which may expose the user or any other person to loss or damage. Users should conduct their own inquiries and rely on their own independent professional advice.

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained in this publication.



Queensland Government



Key **ISSUES**

This section contains more detailed information on some important decision-making areas and information needs for wine grapes. The information supplements our vineyard planning, development and growing guide in Section 3, and should be used in conjunction with it. The information provided in Section 4 is not designed to be a complete coverage of each issue but highlights the key points that need to be known and understood. Where additional information may be useful, we refer you to other parts of the kit. Symbols on the left of the page will help you make these links.



Selecting varieties

2



Selecting rootstocks

8



Quarantine requirements

19



Selecting varieties

Variety selection is one of the most important decisions in the initial establishment of a vineyard because of its influence on future profitability. Vines can be removed or topworked to change varieties in later years, but this is costly in terms of wastage of original plants, cost of replacement material, and lost production until vines start bearing again.

There are more than 40 species of grapevines but only varieties of one, Vitis vinifera, are used in Australia for wine production. A few hybrids such as Chambourcin are grown but wines made from these grapes cannot be exported to Europe under current regulations.

Selecting varieties	2
---------------------------	---

Description of varieties	5
--------------------------------	---

Selecting varieties

Evaluate the potential vigour of your site

If you are still looking for a suitable site take this step after contacting a wine grape expert or winery for advice on suitable production areas.

If you already own land, evaluating the potential vigour of a site will indicate how a particular variety will grow, and what quantity and quality of fruit will be produced. This evaluation is important in helping you select the variety and rootstock, vine spacing, trellis design, and future management of the vineyard.

High vigour sites are a combination of the following points.

- Daytime temperatures of 20 to 25°C during the growing season.
- Fine weather with high levels of sunshine during growth.
- Good moisture availability as a result of adequate, well distributed rainfall, mild weather and soils that are well drained yet have good water holding capacity.
- Well drained loam and clay loam topsoils deeper than one metre and with no restriction to root growth.
- Soils with high natural fertility. This would be assessed by a complete soil analysis.

In contrast, low vigour sites are a combination of the following points.

- Very high or very low temperatures above and below the optimum range.

- Continually overcast, cloudy weather during the growing season.
- Inadequate water supply to support vine growth or excessively wet conditions leading to waterlogging.
- Shallow soils which limit root development and have poor drainage or water holding capacity.
- Soils with low natural fertility.

Contact wineries or winemakers

Most Queensland wine grape growers sell their grapes to wineries or send their crop to a winery to be made into wine under contract. A few Queensland grape growers have or are setting up wineries and employing a winemaker.

Contact with a winery or winemaker is essential in the planning and development stage of a vineyard. You have three objectives from this contact.

- You are trying to obtain information that will help you set up your vineyard. This will include recommendations on the most profitable mix of varieties to suit your vineyard's size and location.
- You are trying to find a buyer or secure access to processing facilities to handle your crop. The current demand for wine grapes may mean that a winemaker may give you an intention to buy your crop. In many cases this will be on condition that initial test crushings and sample batches of wine from your first crop come up to their expectations. Be careful with these negotiations as many wineries have planted vines. Their current demand for grapes may decrease or stop when their plantings start bearing.
- You are trying to establish a good working relationship with the winemaker. This relationship will grow and change as your vineyard matures, but now is the time to decide whether you can work together effectively and both be successful.

Before contacting wineries or winemakers have the following information ready for them.

- Proposed location. You will need to supply specific site details such as climate, soil types and aspect, especially if the area is not known to the winemaker. If you haven't bought land yet, you may get an indication of where you should be looking for a suitable site to deliver the quality and quantity of grapes required.
- Potential areas of production for each block.
- Size of water supply.
- Level of skill that will be available to manage the vineyard. This will be provided by yourself or by employing a manager or skilled foreperson.

You should also ask and get answers to the following questions.

- Which varieties and what volume of each does the winemaker require at present and over the next five years?

- What quality characteristics is the winemaker looking for with each variety?
- What price range is the winemaker willing to pay for each variety at that given quality?
- How much processing capacity does the winemaker have, and is this likely to increase in the next 5 to 10 years?
- What are the winemaker's proposed wine styles for the grapes? Will the wine be sold within Queensland, or exported interstate or overseas?

Decide which varieties and how much area of each to plant

The information gathered from assessing the potential vigour of your site and your meetings with winemakers will help you with these decisions. Growers who only grow and sell fruit may select different varieties to growers who are also winemakers.

Growers should concentrate on varieties that are known to give good yields of quality fruit in their region; that have high market demand at reasonable prices; and that are relatively easy to manage. This is particularly important for small vineyards. These growers should concentrate only on varieties with high market demand.

Grower winemakers also need to consider yield and quality of fruit. They must also be alert to consumer recognition and acceptance of the variety, wine style, and regional identity. They have some flexibility to plant lesser known varieties with the intention of developing a market based on variety and regional distinctiveness.

There are some other factors that you should consider when selecting varieties.

Plan for a minimum of two hectares of each variety in the final vineyard layout. Two hectares will provide about 20 tonnes of fruit which fills a fermentation tank. Smaller amounts of fruit are harder to handle on their own and will probably be blended with fruit from other sources.

Plant no more than four varieties in a vineyard. This number gives a good spread of risk and activity while not overburdening the management of the vineyard.

Grow white and red varieties. Again this spreads the risk by minimising the consequences of adverse weather during the season damaging grapes. Red varieties, for example, generally mature later than whites and may not be affected adversely by wet weather at harvest time for white varieties.

A suggested ratio of white to red varieties is:

- | | |
|---|----------------|
| <ul style="list-style-type: none"> • Granite Belt (or cool growing regions) • Other warm/hot Queensland regions | 50:50
60:40 |
|---|----------------|

Consider the site's potential and your target market when determining the final mix of white and red varieties. At present the Queensland market prefers white wine styles and there is more demand for white varieties. White varieties also tend to produce better wines in hot areas than red varieties, hence the 60% whites: 40% reds recommendation for warm/hot areas.

Be careful when selecting late maturing varieties for areas where birds may be a problem. Birds will be bigger pests on isolated vineyards or blocks. The longer fruit is on the vine, the more time for damage. As early varieties are harvested, birds concentrate on the remaining varieties and these are damaged even more.

Select rootstock if using grafted vines

Rootstocks are recommended for Queensland plantings. Rootstocks can be selected which increase vine vigour or provide tolerance of nematodes, phylloxera, drought, or salinity. However, they are more expensive.

Description of varieties

Tables 1 and 2 list the main features of wine grape varieties that are commercially suitable for Queensland and assessments of potential performance. The tables do not include all wine grape varieties.

Some comments on Tables 1 and 2

Market demand

A rating by winemakers of current and projected demand for the next five years for a variety and price they are prepared to pay. It includes domestic and export demand.

Ease to grow

A rating of how easy it is to manage the variety in Queensland to produce good yields of quality fruit. The rating covers susceptibility to diseases; tolerance of excessively wet, dry, hot or cool weather which may affect flowering; fruit set or berry development; and vigour; all of which influence yield.

Overall

This rating combines the ratings for market demand and ease to grow into an overall recommendation for the variety.



Selecting rootstocks
Section 4 page 8



References
Section 6 page 22

Table 1. White wine grape varieties suitable for Queensland

Name	Vigour	Maturity	Market	Suitability for wine grape growing areas			Ease to grow	Overall demand
				All areas	Granite Belt/cool areas	Hot inland		
Chardonnay	Mod	Early	\$\$\$\$\$\$	✓				
Colombard	High	Mid	\$\$	✓				
Marsanne	High	Mid	\$\$	✓				
Sauvignon Blanc	High	Mid	\$\$\$	✓				
Semillon	High	Mid	\$\$\$\$\$	✓				
Verdelho	Mod	Early	\$\$\$	✓				
Chenin Blanc	High	Early to Mid	\$\$	✓				
Emerald Riesling	High	Late	\$	✓				
Muscadelle	High	Early	\$\$	✓				
Muscat Gordo Blanco	Low	Late	\$\$	✓				
Riesling	Mod	Mid	\$\$	✓				
Traminer	Mod	Mid	\$\$	✓				
Crouchens	High	Mid	\$	✓				
Doradillo	Mod	Late	\$	✓				
Muller-Thurgau	High	Early	\$	✓				
Palomino	High	Mid	\$	✓				
Pedro Ximenez	High	Early	\$	✓				
Sultana	High	Early	\$	✓				
Sylvaner	High	Mid	\$	✓				
Taminga	High	Late	\$	✓				
Trebbiano	High	Late	\$	✓				
Viognier	Mod	Mid	\$	✓				
White Frontignac	Mod	Early	\$	✓				

Table 2. Red wine grape varieties suitable for Queensland

Name	Vigour	Maturity	Market	Suitability for wine grape growing areas		Ease to grow	Overall demand
				All areas	Granite Belt/cool areas		
Cabernet Sauvignon	High	Mid to Late	\$\$\$\$\$\$	✓			
Shiraz	High	Mid	\$\$\$\$\$	✓			
Merlot	Mod	Mid	\$\$\$\$	✓			
Cabernet Franc	High	Mid	\$\$\$	✓			
Grenache	High	Late	\$\$\$			✓	
Mataro	High	Late	\$\$\$			✓	
Ruby Cabernet	High	Late	\$\$\$			✓	
Brown Frontignac	Mod	Early	\$\$	✓		✓	
Chambourcin	High	Early	\$			✓	
Malbec	High	Mid	\$\$\$			✓	
Nebbiolo	Low	Late	\$			✓	
Tarrango	High	Late	\$\$			✓	
Barbera	Mod	Late	\$	✓			
Durif	High	Mid	\$	✓			
Pinot Noir	Mod	Early	\$\$			✓	
Sangiovese	Mod	Mid	\$			✓	
Touriga	High	Mid	\$			✓	
Zinfandel	Mod	Early to Mid	\$			✓	
Vigour				Maturity		Market demand	
Rate of shoot growth during season:				Period when fruit is normally harvested in Queensland.		The more \$ signs, the greater demand at very good prices.	
High	More than 1.8 m			Early		January to early February	
Moderate	1.2 to 1.8 m			Mid		Mid February to late March	
Low	Less than 1.2 m			Late		April or later	
Overall				Ease to grow		The longer the bar, the easier it is to manage the variety.	



Selecting rootstocks

This section will help you decide whether to use rootstocks and which ones to plant. It discusses a range of rootstocks that are considered commercial propositions for the Queensland wine industry.

The Department of Primary Industries recommends that rootstocks are used in all new plantings of vineyards throughout Queensland because of the widespread distribution of nematodes, threat of introduction of phylloxera, and their ability to cope with adverse soil and climatic conditions.

Do I use rootstocks or not?	8
Presence or threat of nematodes	8
Threat of phylloxera	11
Poor vine performance caused by vineyard soil and climate	12
Availability of rootstock planting material.....	14
Selecting which rootstocks to use	15
Description of rootstocks.....	16

Do I use rootstocks or not?

Growers have the choice of using grafted or own-rooted vines (that is the variety has not been grafted onto a rootstock). The decision on whether to use a rootstock, and which one to use, is possibly even more important than varietal selection. Introducing or changing rootstocks means establishing new vines and this is more expensive than topworking vines because of longer lost production.

Use of rootstocks depends on assessing whether the potential risks to vineyard health and productivity justify the investment in rootstocks which may overcome some or all of these problems. The following risks confront wine grape growers.

Presence or threat of nematodes

Nematodes are microscopic, worm-like organisms that live in soil. They attack roots of susceptible crops, leading to poor health, reduced productivity and even death. The species that damage grapevines are:

- Root knot nematode (*Meloidogyne* spp.)
- Root lesion nematode (*Pratylenchus* spp.)
- Citrus nematode (*Tylenchulus* spp.)
- Dagger nematode (*Xiphinema* spp.)

What are the risks from nematodes?

Own-rooted vines are susceptible to nematode attack. If nematodes infest a vineyard with own-rooted vines, they will cause a slow decline in vine health and crop loss if left untreated.

Nematodes are widely distributed in most Queensland soils and it is likely that your soil will have them. They are prevalent in the sandy soils of the Granite Belt.

They are often present in re-plant sites following previous vineyards or other susceptible crops and pastures. You are likely to have nematodes present if planting a vineyard on land previously used for agriculture.

Nematodes are less likely to be present in virgin soils that have not been cropped. If you are developing a virgin soil site and nematodes are not present, it is possible to reduce the likelihood of their introduction. They are introduced into new sites by:

- planting vines with infested roots;
- planting vines grown in potting mix infested with nematodes;
- infested soil on farm machinery or people's boots moving between vineyards;
- water containing nematodes which is used for irrigation, or surface or underground water which moves into the vineyard from neighbouring contaminated sites.

If nematodes are present or are introduced into a vineyard and are left untreated, their numbers will tend to increase by infesting vines and susceptible weeds.

Trials throughout Queensland and Australia have shown varieties on nematode tolerant rootstocks produced two to five times more fruit than varieties on own-rooted vines.

What are the alternatives to rootstocks to manage nematodes?

The alternatives to rootstocks to manage nematodes will only suppress their population in soils. Any nematodes still present can continue to infest vine roots.

Nematicides, however, can be used in some situations.

Application of nematicides. Nemacur® is presently registered in Queensland for use on grapes. There are several disadvantages from using it each year.

- The chemical is highly toxic and must be handled carefully.
- Micro-organisms in soils break down the chemical. Repeated use of Nemacur® leads to a build-up of these micro-organisms and an increasingly rapid break down of the chemical, so that its effectiveness is reduced.
- Only vine rows are treated. Nematodes from the interrow will re-infest vines as the effect of the nematicide declines.

Nematicides should not be relied on for long term control of nematodes. They are best used as strategic applications in combination with other measures such as rootstocks to suppress nematodes before planting. In mature vineyards nematicides can be used to prevent nematode build-up to damaging levels.

Maintenance of high soil organic matter levels in vine rows. Soil organic matter encourages soil micro-organisms which feed on and compete with nematodes. There are disadvantages to maintaining high soil organic matter.

- Organic mulches must be re-applied to maintain their effectiveness.
- Purchase and spreading costs of organic matter add to vineyard operating costs.
- Organic mulches only suppress nematodes. There will still be some infestation of grape roots.
- Use of organic matter on highly fertile soils with good water holding capacity can result in excessively vigorous vines.

Application of organic matter is best used in combination with other treatments such as rootstocks. Organic matter is unlikely to be completely effective against nematodes on its own.

What should I do?



Nematode samples
Section 3 page 4

Take a soil and/or root sample to determine if nematodes are present; identify the species; and count their numbers. The laboratory report will indicate what is the risk from nematodes and whether rootstocks should be used.

If nematodes are not present you may choose not to invest in rootstocks. Instead, set up procedures to prevent their introduction into your vineyard. This will involve the following procedures.

- Making sure that nurseries supply vines that are free of nematodes. Dormant bare-rooted vines should be treated with hot water and sterilised potting mix should be used for container grown vines.
- Making sure that machinery or visitors to the vineyard do not bring in contaminated soil.
- Making sure water and/or soil from neighbouring vineyards or susceptible crops is prevented from entering your vineyard. This may involve works such as interception drains.

What does DPI suggest?

DPI recommends the use of nematode tolerant rootstocks for all Queensland vineyards because nematodes are widespread in the state's soils and they are difficult to control in established vineyards.

Threat of phylloxera

Phylloxera is an aphid which attacks only grapevines. It lives on the roots and leaves. Insects hatch from leaf galls and, seeking nourishment, enter the soil to attack the vine's roots. Symptoms of phylloxera infestation are a premature yellowing of leaves in autumn. At first the problem will be confined to a small group of vines where the initial infestation occurred. These vines become weaker and the number of affected vines increases as the aphid spreads. Galls can be found on the roots of these vines. Phylloxera will eventually devastate a vineyard if no action is taken.

What are the risks from phylloxera?

At present, phylloxera is found only in the Rutherglen, Mooroopna, Nagambie and Whitlands areas of Victoria, and in New South Wales in the counties of Camden and Cumberland (near Sydney), the shires of Hume and Corowa, and the city of Albury. The most common method of spread is on rooted planting material. It is also spread by equipment and people moving between vineyards.

The grape industry has adopted a national strategy to prevent spread of phylloxera. Queensland participates in this strategy by requiring that all vines and fruit entering the state come from nurseries or vineyards approved by the DPI. Consignments are accompanied by a phylloxera certificate indicating the nursery's or vineyard's status.

As long as these procedures are followed, the risk of phylloxera entering Queensland is very low. The danger is more likely if someone imports vines without following these procedures.

Vines on own roots are very susceptible to phylloxera. If phylloxera does enter vine production areas, own-rooted vines will be most at risk.

The use of phylloxera resistant rootstocks is an insurance against the threat of the insect's introduction into Queensland, and its potential to devastate the industry.

Fortunately, Queensland's soils and climate are not as favourable for phylloxera as they are for nematodes. This means that a phylloxera infestation is less likely to take hold in Queensland. If it does, it should be easy to eradicate by vine removal and quarantine.

What are the alternatives to rootstocks to manage phylloxera?

No effective chemical controls are available. If you get a phylloxera outbreak, you will have to remove vines. Your vineyard and those around you will be placed under quarantine to prevent further spread of the aphid.



Quarantine
restrictions
Section 4 page 19

What should I do?

Follow the procedures for importing vines into Queensland from other states. Contact a DPI plant health officer or local extension officer if you are not sure of the regulations. Remember:

- All interstate sources of planting material and wine grapes (for crushing) must be approved by DPI.
- All consignments of planting material and wine grapes must be accompanied by a phylloxera certificate.
- If you become aware of others importing grape material from unapproved interstate sources or without the proper certificate, notify DPI immediately. You are safeguarding your future productivity as well as the state's wine and table grape industry.

Monitor your vineyard's performance and identify reasons for poor vine growth to rule out phylloxera as a cause.

What does DPI suggest?

DPI recommends the use of phylloxera tolerant rootstocks for all Queensland vineyards because phylloxera is so devastating to vines and the long term investment in vineyards is so great.

Poor vine performance caused by vineyard soil and climate



Selecting rootstocks
Section 4 page 8

Good yields of quality fruit rely on vines growing well without becoming excessively vigorous. Soil depth, texture and fertility interact with temperature and rainfall to provide conditions that either favour poor, normal or excessive growth. Rootstocks can be used to overcome adverse vineyard conditions that would otherwise limit production.

What are the risks in my vineyard?

Shallow or poorly drained soils in regions with high spring/summer rainfall may become waterlogged. Waterlogging reduces shoot and root growth and vines can die. Vines on own roots seem to suffer from waterlogging sooner than vines on some rootstocks.

Assessing the risk of waterlogging is difficult because it means predicting rainfall which could lead to waterlogging. If your vineyard soil is poorly drained you will be at greater risk from waterlogging. Rootstocks which tolerate waterlogging will be of benefit.

Vines growing in shallow, sandy textured soils with low water holding capacity are at risk from short term water stress or drought. This is particularly so in regions with low or poorly distributed rainfall or where water supplies for irrigation are inadequate for the area under crop. Water stress at budburst, flowering and fruit set, and veraison reduces yield and fruit quality. Some rootstocks have better drought tolerance than own-rooted vines.



Fertilisers
Section 3 page 39

Short term water stress occurs regularly in Queensland. Droughts are harder to predict. Vines are more at risk if you have a sandy soil with low water holding capacity, and your water supply is limited or inadequate for the size of vineyard. If you are using drought tolerant rootstocks, and water becomes limiting, your vines may not suffer as badly and will recover more quickly than those on own roots.

Sandy textured soils with low water holding capacity often have a low base level of fertility because nutrients are leached easily out of the topsoil. Low fertility results in low vine vigour. Fertility can be improved by applying fertilisers but more will be needed in these soils. Many rootstocks have bigger root systems than own-rooted vines and a greater ability to extract nutrients. Most rootstocks will increase vine vigour.

If you are growing low or moderate vigour varieties on sandy, low fertility soils, yields may be so low as to be unprofitable. Rootstocks can be used to increase vine vigour and yields while still maintaining fruit quality.

High levels of chloride in vines lead to poor growth, yields and reduced wine quality. Chloride accumulates in vines in soils with high natural chloride levels, or when levels increase in water supplies and then in soils after irrigating with this water. Many rootstocks have the ability to limit the uptake of chloride by vines.

You are more at risk from chloride accumulation with own-rooted vines growing in loam and clay soils with poor soil water drainage in low rainfall areas. Drought will increase the risk of chlorides building up in water supplies.



Before you start
Section 1 page 5

What are the alternatives to rootstocks to manage soil and climate?

Careful site selection will reduce the need for rootstocks to overcome the problems caused by soils, climatic conditions or inadequate water.

Correct fertilising and watering of vines will minimise the risk of problems developing. Soil and plant nutrient analysis and soil water monitoring will help your management.

What should I do?

Gather information on the climate and thoroughly assess the soil and water resources of the vineyard site, preferably before purchase or before deciding whether to use rootstocks.



Planning vineyard development
Section 3 page 3

What does DPI suggest?

DPI recommends the use of suitable rootstocks for Granite Belt vineyards because:

- soils are poor;
- rainfall is unpredictable, and water stress and drought are common;
- vine vigour and yield are low.

DPI would recommend the use of suitable rootstocks for other areas in Queensland where:

- soils are poor;
- short term water stress is common;
- vine vigour and yield are low.

Availability of rootstock planting material

Queensland growers often find it difficult to obtain rootstock cuttings (unrooted or bare rooted) or grafted vines to meet their needs. At present the best material comes from Vine Improvement Scheme nurseries in southern states. Increased plantings Australia-wide have placed great demand on these nurseries, who give priority to growers in their state. Queensland does not have a functioning Vine Improvement Scheme but several nurseries in Queensland are supplying vines.

What are the problems in obtaining rootstock planting material?

There are three problems.

- You may not be able to obtain the rootstocks you prefer.
- You may not be able to get enough of the rootstocks you want. This is troublesome because it is difficult to manage vineyard blocks with mixtures of grafted and own-rooted vines.
- You may not be able to get rootstocks from a quality nursery supplier.

What are the alternatives to obtaining rootstock planting material?

If you are still deciding whether to use rootstocks or not, their availability may cause you to re-evaluate your decision. If you still decide that rootstocks should be used in your vineyard, you can delay your order until it can be filled. This will mean missing a whole season.

There are two less preferred options.

- Accept less desirable rootstocks which may be available but which may not be as suited to your site as your first preference.
- Go to a different nursery whose material may be of a lower quality than the original nursery you contacted.

What should I do?

Make sure that you really do need rootstocks. Reviewing the decision with a wine grape consultant may be a worthwhile exercise.

Try to contact nurseries and place an order as soon as possible after you have decided to use rootstocks. Nurseries need at least 12 to 18 months notice of your requirements.

Be patient if you are unable to obtain the rootstocks you want, when you want them. If you are able to manage financially, it is better to forego a season and set up the vineyard properly with its long term profitability in mind, rather than rush in and limit its future potential.

What does DPI suggest?

DPI recommends the use of rootstocks in all new plantings throughout Queensland. If your decision to use rootstocks is sound—presence of nematodes and the need to improve vigour—and you have planned your requirements well ahead and made timely contact with nurseries, then the rootstocks should be available. Even if there are problems, it is better in the long run to buy the desired rootstocks rather than settle for second best or a quick answer.

Selecting which rootstocks to use

Once you have decided to use rootstocks, the next decision is which ones to use. The information gathered on whether to use rootstocks or not is also useful in selecting the type of rootstock. This information includes:

- presence, species and numbers of nematodes;
- depth, texture and fertility of topsoil and subsoil;
- amount and distribution of rainfall;
- amount and quality of water sources for irrigation;
- availability, range and quality of rootstocks from local and interstate nurseries.

The following points must also be considered.

Vigour of the variety to be grown on the rootstock

The vigour of the variety to be grown on the rootstock can be checked from Tables 1 and 2 in *Selecting varieties* in this section of the kit. For example it would be unwise to graft a vigorous variety onto a vigorous rootstock unless soil and climatic conditions were going to severely limit vine vigour.

Incompatibility between variety and rootstock

Most varieties are compatible with most rootstocks. However, there are some specific incompatibilities (Table 3).



Planning vineyard
development
Section 3 page 3



Vigour of varieties
Section 3 page 6

Table 3. Incompatible variety/rootstock combinations

Variety	Incompatible rootstocks	Comments
Muscat Gordo Blanco	Ramsey, 34 EM	
Chardonnay	5C Teleki (also known as SO 4)	Based on some local experiences in various Australian regions.
	5A Teleki (also known as 5BB Kober)	Incompatibility observed in Australia and France.
Shiraz	Ramsey	Based on varying grower experiences where wine colour was adversely affected.
	101-14	Vines grow poorly.
Muscadelle	Ramsey	
Colombard	101-14	Vines grow poorly.
Trebbiano	101-14	Vines grow poorly.
Sultana	J17-69	

Effect of rootstock on fruit (and wine) quality

Most rootstock trials have concentrated on growth and yield of varieties. Limited testing has shown that rootstocks can also influence the quality of fruit and therefore the wine that is produced. The nature of these effects is poorly understood. More testing is needed, particularly to determine rootstock performance under Queensland conditions. Here are some of the effects that you should be aware of when selecting rootstocks.

Influence on maturity time. Rootstocks may accelerate or delay fruit maturity. The rootstock 101-14, for example, tends to promote earliness in grapes whereas Ramsey, Dog Ridge, 110 Richter and 140 Ruggeri tend to delay maturity.

Influence on fruit composition. In various Australian and overseas trials the following observation were made.

- As rootstock vigour increases, higher fruit levels of total nitrogen, acid, tannin, potassium and a higher pH will tend to occur.
- High vigour rootstocks such as Ramsey and Dog Ridge tend to produce less colour in red varieties.
- Victorian trials showed that Harmony, Dog Ridge, Freedom and Rupestris du Lot gave high juice pH whereas 140 Ruggeri, 1202, 5A Teleki, 5C Teleki and 101-14 gave low juice pH.

Description of rootstocks

Table 4 summarises the main features of rootstocks which are commercially suitable for Queensland. It is not an exhaustive list and does not try to provide complete descriptions or assessments of potential performance.

All rootstocks recommended here are resistant to phylloxera.



References Viticulture Vol. 2: Practices
Section 6 page 23



References
Section 6 page 23

Some comments on Table 4

Nematode tolerance, tolerance of drought and salinity

Ability of rootstock to tolerate the given nematode species or condition.

Overall

This rating combines all the information given in Table 4, as well as information given in the literature on effects of rootstock on wine quality, to give an overall recommendation for the rootstock for Queensland conditions.

Table 4. Rootstocks for wine grapes

Rootstock	Vigour	Nematodes	Tolerance of		Overall
			Drought	Salinity	
5BB Kober	Mod				
5C Teleki	Mod				
110 Richter	Mod				
1103 Paulsen	High				
140 Ruggeri	High				
5A Teleki	Mod				
99 Richter	Mod				
K51-32	Mod				
Ramsey	High				
Schwarzmann	Mod				
34 EM	Mod				
1613 Couderc	Mod				
3306 Couderc	Mod				
Freedom	Mod				
Harmony	Mod				
Rupestris du Lot	Mod				
K51-40	Mod				
Vigour		Nematode	Drought		
Effect of rootstock on variety shoot growth is described as High, Moderate or Low.		The longer the bar, the higher the tolerance level to given nematode species.	The longer the bar, the higher the tolerance level to drought.		
			Salinity		
			The longer the bar, the higher the tolerance level to saline soil.		
			Overall		
			The longer the bar, the more consideration should be given to using this rootstock.		
			NIA		
			No information available		



Quarantine requirements

The entry of grapevine planting material into Queensland is governed by a set of regulations (Order in Council, February 1990) designed to protect the state's industry from serious pests and diseases which are present in some other states. Queensland also participates in a national scheme to prevent the spread of phylloxera, regarded as the world's worst grape pest, in the Australian industry. Everyone bringing grapevine planting material into Queensland must follow the regulations.

What you are expected to do 19

Why approval is needed 20

What you are expected to do

1. You must obtain approval from DPI to bring grapevine planting material into Queensland from any of the other states or territories. This is done by contacting either:

Grape Extension Specialist
DPI
PO Box 501
STANTHORPE Q 4380
Ph: (07) 4681 1255; Fax: (07) 4681 1769
OR

The Manager
DPI Plant Health Control
GPO Box 46
BRISBANE Q 4001
Ph: (07) 3239 3942; Fax: (07) 3211 3293

They will want to know from where the planting material is being sourced.

If the source is a nursery or vineyard in New South Wales or Victoria, it must be accredited with the DPI as being in a phylloxera free area of that state. This DPI accreditation is obtained following receipt of a completed *Application for the Accreditation of a Nursery for the Export of Grapevines to Queensland* (Form Q3).

This form identifies the source of the planting material and includes certification signed by a state Department of Agriculture inspector that the source is situated more than 40 km from any known site where

grape phylloxera has been recorded. If this certification is provided, the Manager, DPI Plant Health Control will approve the source.

If the source is a nursery or vineyard in South Australia, Western Australia, Tasmania or Northern Territory, contacting either of the two DPI officers above will result in approval being given.

2. When approval is given, a Form Q4 will be sent to you. This is a certificate to accompany each consignment of grapevine planting material. Complete the form and attach one copy to the consignment or have the transporter carry it. Before the consignment leaves, send one copy of the completed form to:

The Manager
DPI Plant Health Control
GPO Box 46
BRISBANE Q 4001
Fax: (07) 3211 3293

3. Accreditation of NSW and Victorian sources with DPI lasts until 31 December of each year. Accredited nurseries and vineyards in these states must re-apply to DPI regarding renewal of accreditation for the following year.

Why approval is needed

The requirement for approval is to protect the Queensland grape industries from the introduction of phylloxera (*Daktulosphaira vitifoliae*). This aphid pest lives on roots and leaves and attacks only grapes. It is regarded as the world's worst grape pest. Insects hatch from leaf galls and, seeking nourishment, enter the soil to attack the vine's roots. Symptoms of phylloxera infestation are a premature yellowing of leaves in autumn. At first the problem will be confined to a small group of vines where the initial infestation occurred. These vines become weaker and the number of affected vines increases as the aphid spreads. Galls can be found on the roots of these vines. Phylloxera will eventually devastate a vineyard if no action is taken.

At present, phylloxera is found only in the Rutherglen, Mooroopna, Nagambie and Whitlands areas of Victoria, and in New South Wales in the counties of Camden and Cumberland (near Sydney), the shires of Hume and Corowa, and the city of Albury. The most common method of spread is on rooted planting material. It is also spread by equipment and people moving between vineyards.

The Australian grape industry has adopted a national strategy to prevent spread of phylloxera. Queensland participates in this strategy by requiring that all vines and fruit entering the state come from a DPI approved source.