

Chapter 6  
Vineyard Management

<p>SITE SELECTION</p>	<p><b>1. Environmental conditions</b> Grape grower assesses average rainfall/temp/sunlight. Soil - fertility/drainage. Influence grape variety, planting density, training, trellising.</p> <p><b>2. Business considerations</b> Proximity to utilities (water/power), availability of workforce, accessibility to site machinery, cost of land.</p> <p><b>3. Grape variety</b> Climactic conditions considered. Demand. EU may restrict variety.</p>
<p>PLANTING/ REPLANTING</p>	<p><b>For new plantings:</b></p> <ul style="list-style-type: none"> <li>● Vegetation cleared</li> <li>● Fertility of soil assessed/corrected</li> <li>● Young vines (brought pre-grafted from nurseries) planted - hand or machine</li> <li>● Individual plastic sleeves to protect against animals</li> <li>● Sometimes irrigation necessary</li> <li>● First yield after 3 years</li> </ul> <p><b>Replanting</b></p> <ul style="list-style-type: none"> <li>● Most vines replaced after 30-50 years</li> <li>● Old vines produce high concentration fruit but not high yield/can be disease prone</li> <li>● Vineyard left “fallow” (unplanted) after vines dug up to recover nutrients</li> </ul>
<p>MANAGING THE VINE</p>	<p>(Goal: to maximise production of fruit)</p> <p><b>Vine training</b></p> <ul style="list-style-type: none"> <li>❖ Shape permanent wood on vine - either <b>low trained</b> (to benefit from heat) or <b>high trained</b> (benefit from above frost).             <ul style="list-style-type: none"> <li>➢ <b>Head training</b> = little permanent wood, either just trunk or few short arms growing on top of trunk (spur pruned or replacement cane pruned).</li> <li>➢ <b>Cordon training</b> = trunk with one or more permanent horizontal arms (cordons) - usually spur pruned. Longer to establish as more wood → but easier to machine harvest. Usually 1 or 2 cordons but 4+ on larger structures.</li> </ul> </li> </ul> <p><b>Vine pruning</b></p> <ul style="list-style-type: none"> <li>❖ Removal of unwanted leaves, canes, permanent wood</li> <li>❖ Winter/summer pruning</li> </ul>

- Winter - determine number of buds/location in coming growing season.
  - Buds can't be too close together (canopy management)
- Winter pruning styles:
  - **Spur pruning** = short sections of one year old wood cut to 2 or 3 buds. Spurs distributed along cordon of wood (cordon trained) or top of trunk (head-trained).
  - **Replacement cane pruning** = canes are longer (8-20 buds). 1-2 canes retained and tied horizontally to trellis for support. (Usually for head-trained vines, more complex, skilled workforce required). *Guyot - single or double.*
- Summer pruning
  - Restrict vegetative growth so sugar can go to grape
  - Leaf stripping - grapes have sunshine exposure

### Trellising and Canopy Management

Managing green parts (leaves, etc) of the vine

Trellis = permanent stakes + wires that support replacement cane and vine growth.

#### ❖ Untrellised vineyards

- Vines hang down to the ground (bush vines)
- Head-trained + spur-pruned
- For hot, dry, sunny, warm climates as extra shade helps protect grapes (ie, S Rhone + Barossa Valley). Not suitable for cool/damp climates - as no airflow promotes fungal disease.
- Beaujolais - head-trained/spur-pruned tied at tips to expose bunches to sunlight/air (*Gobelet*)
- Can't mechanically harvest

#### ❖ Trellised vineyards

- Lines + horizontal wires/canes + shoots tied to trellis
- 3 reasons for canopy management (trellis):
  - Control amount of [sunlight exposure](#)
  - Open canopy improves [air circulation](#)
  - Aid [mechanisation](#) in the vineyard
- VSP ('Vertical Shoot Positioning') = trained vertically + tied into place onto trellis forming single canopy (canopy is open/aerated/shade free).
  - If not, VSP → top of shoot slop over for shape

### Density (no of vines per hectare)

- Hectare (area enclosed by square with 100m sides)
- One acre = 0.4 hectares
- Density varies (1000 vines per hectare → 10,000 vines per hectare)
- Availability of nutrients/water considered

	<p><b>Very limited water availability</b></p> <ul style="list-style-type: none"> <li>● In low rain areas, large densities mean roots compete less for water</li> </ul> <p><b>Low levels of nutrients and sufficient rainfall</b></p> <ul style="list-style-type: none"> <li>● High water/low nutrients = vine still thrives</li> <li>● Vines planted in high density (to stop vegetative growth) <ul style="list-style-type: none"> <li>○ Promotes root competition</li> </ul> </li> <li>● Bud numbers after winter pruning important <ul style="list-style-type: none"> <li>○ Carbohydrates in vine (energy) - too few buds and vegetative growth high/too many and not enough energy to ripen crop</li> </ul> </li> <li>● High plant density + strict bud control common in European vineyards</li> </ul> <p><b>High levels of nutrients and sufficient rainfall</b></p> <ul style="list-style-type: none"> <li>● Very fertile soil = bad for viticulture</li> <li>● New world (more fertile) - low density plantings using vines with multiple canes + cordons <ul style="list-style-type: none"> <li>○ High quality and high yield</li> </ul> </li> </ul> <p><b>Yield</b> (measure of grapes produced)</p> <ul style="list-style-type: none"> <li>● Measured (a) in weight (tonnes) and (b) by volume (hectolitres of wine per hectare)</li> <li>● Producers predict yields - legal reasons (EU)/contractual obligations/how much space in tank for wine needed</li> <li>● Estimates made by bud after winter pruning - but frost, poor fruit set, disease all reduce figures</li> <li>● If yield too high - green harvesting (removing immature grapes after véraison) <ul style="list-style-type: none"> <li>○ If wrong time, vine will compensate and add energy to grapes = returning yield to original size.</li> </ul> </li> </ul> <p><b>Yields and quantity</b></p> <p>No solid link between low yields and quality</p>
<p><b>MANAGING VINEYARD PESTS AND DISEASES</b></p>	<p>Disease/hungry animals Damage to leaves - impacts photosynthesis</p> <p><b>Pests</b></p> <ul style="list-style-type: none"> <li>❖ Phylloxera</li> <li>❖ Nematodes <ul style="list-style-type: none"> <li>➢ Def. Microscopic worms that attach vine's roots (affecting water/nutrients)</li> <li>➢ Prevent = sanitise soil before replanting and use resistant rootstock</li> </ul> </li> <li>❖ Birds and mammals</li> </ul>

	<ul style="list-style-type: none"> <li>➤ Prevent: Netting against birds/protective fencing against rabbit/deer/boar</li> <li>❖ Insects             <ul style="list-style-type: none"> <li>➤ Prevent: Insecticides or integrated pest management (more environmentally friendly).</li> </ul> </li> <li><b>Fungal diseases</b> <ul style="list-style-type: none"> <li>❖ Downy and powdery mildew                 <ul style="list-style-type: none"> <li>➤ Fungi = warm/humid - thrive in all green parts of vine. Grapes lose fruit flavours/bitter taint.</li> </ul> </li> <li>❖ Grey rot                 <ul style="list-style-type: none"> <li>➤ Caused by Botrytis Cinerea = damp conditions</li> <li>➤ Taint flavour, loss of colour in black grapes</li> <li>➤ Good for certain white grapes (sweet wines)</li> </ul> </li> </ul> </li> <li><b>Fungicides</b> <ul style="list-style-type: none"> <li>● Powdery mildew = sulfur-based spray</li> <li>● Downy mildew = Bordeaux-mixture, copper-based spray</li> <li>● Spray by tractor</li> <li>● Maritime climate = more spraying (high rainfall)</li> <li>● Canopy management → open vine canopy means far more airflow</li> <li>● Spraying stops close to harvest (no residual harmful chemicals)</li> </ul> </li> <li><b>Other diseases</b> <ul style="list-style-type: none"> <li>● Viruses - contagious, spread via cuttings/nematodes. No cure, must dig up vines, sanitise land.</li> <li>● Bacterial diseases - sharpshooters (insects that spread bacteria). No cure - strict quarantine - interrupt sharpshooter lifecycle - dig up vines, sanitise land.</li> </ul> </li> </ul>
<p>VITICULTURAL PRACTICES</p>	<p>Chemicals negative effect on land, sustainable alternative include:</p> <p><b>Sustainable agriculture</b></p> <ul style="list-style-type: none"> <li>● Chemical spray restricted</li> <li>● Growers consider yearly weather/pest/disease potential + prevent (sometimes with chemicals, but less so)</li> <li>● Integrated pest management = predator of pest encouraged to live on land (biodiversity)</li> <li>● Range of plants in vineyard = habitat for predator of pest + nutrients when ploughed into soil.</li> </ul> <p><b>Organic agriculture</b></p> <ul style="list-style-type: none"> <li>● Limited treatment against pests/diseases (small quantities)</li> <li>● Accreditation needed from organic certification body             <ul style="list-style-type: none"> <li>○ Must work towards conversion to organic standards before</li> </ul> </li> </ul>

	<p style="text-align: center;">certification</p> <p><b>Biodynamic agriculture</b></p> <ul style="list-style-type: none"> <li>● Rudolf Steiner/Maria Thun - organic practices + philosophy + cosmology</li> <li>● Soil = integrated with earth/other planets - homoeopathic 'preparations' used to fertilise the soil, treat diseases, ward off pests</li> <li>● Certification bodies available</li> </ul>				
<p>HARVEST</p>	<ul style="list-style-type: none"> <li>➤ Begins when grape grower believes the fruit will create desired style of wine</li> <li>➤ If bad weather - harvest bright forward to save crop</li> <li>➤ Coordinate harvest to not overwhelm winery with fruit</li> </ul> <p><b>Machine harvesting</b></p> <ul style="list-style-type: none"> <li>● Shakes trunk of wine - collect ripe berries that fall (as well as unripe/damaged grapes, leaf, insects, MOG (matter other than grapes)).</li> <li>● Sorted at winery</li> </ul> <table border="1" data-bbox="414 932 1414 1146"> <tr> <td data-bbox="414 932 915 1146"> <p>Advantages:</p> <ul style="list-style-type: none"> <li>● Speed</li> <li>● Work through the night (keep grapes cool)</li> </ul> </td> <td data-bbox="915 932 1414 1146"> <p>Disadvantages:</p> <ul style="list-style-type: none"> <li>● Only flat/gently sloping land</li> <li>● Cannot be used for wines with whole bunch style (champagne/beaujolais)</li> </ul> </td> </tr> </table> <p><b>Hand harvesting</b></p> <ul style="list-style-type: none"> <li>● Individual workers using secateurs (to cut)</li> </ul> <table border="1" data-bbox="414 1293 1414 1507"> <tr> <td data-bbox="414 1293 915 1507"> <p>Advantages:</p> <ul style="list-style-type: none"> <li>● Good for sweet wine</li> <li>● Less grape damage</li> <li>● Stems intact - the whole bunch harvested</li> </ul> </td> <td data-bbox="915 1293 1414 1507"> <p>Disadvantages</p> <ul style="list-style-type: none"> <li>● Must be used on steep slopes</li> <li>● Expensive/labour intensive</li> </ul> </td> </tr> </table>	<p>Advantages:</p> <ul style="list-style-type: none"> <li>● Speed</li> <li>● Work through the night (keep grapes cool)</li> </ul>	<p>Disadvantages:</p> <ul style="list-style-type: none"> <li>● Only flat/gently sloping land</li> <li>● Cannot be used for wines with whole bunch style (champagne/beaujolais)</li> </ul>	<p>Advantages:</p> <ul style="list-style-type: none"> <li>● Good for sweet wine</li> <li>● Less grape damage</li> <li>● Stems intact - the whole bunch harvested</li> </ul>	<p>Disadvantages</p> <ul style="list-style-type: none"> <li>● Must be used on steep slopes</li> <li>● Expensive/labour intensive</li> </ul>
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