
Chapter 4

The Vine



Vine Species

- *Vitis vinifera* = (Eurasian) produces all winemaking grapes
- American vines = (3 important species) - unpleasant flavours so not used for winemaking. Resistant to Phylloxera so used to produce rootstock.

Grape Varieties

- The difference in colour/flavour for every variety
- Grower must consider budding and ripening - and resistance to disease

Cutting = section of the vine shoot that is planted and then grows as a new plant (used widely in commercial nurseries)

Layering = cane is bent down with a section buried into the ground. Buried section takes root, roots become established, then can linking to new growth to the original plant cut (takes place in vineyard)

- Cutting more popular due to Phylloxera risk
- **New plant identical in both**
- Vine variety/grape variety = interchangeable
- Cultivar/variety = interchangeable.

Creating New Vine Varieties

- New grape varieties with more desirable characters can be created using cross-fertilisation.

Cross fertilisation = Pollen from a male part of the flower of one vine is transferred to the female part of the flower of another vine and fertilisation occurs.

- ***It will be a new variety - as genetically different from parents!***
- No way of knowing what qualities variety will have
- Can be costly/time-consuming
 - Seedlings often fail in 1st year/ 2-3 years to see if grapes actually produced
 - Not necessarily commercially viable

Crossing = when a new variety is produced from two parents of the same species (usually *Vitis Vinifera*)

- Technically, every grape variety a crossing
- Common term for grape varieties bred by researchers (ie, Muller Thurgau = Riesling x Madeleine Royale)

Hybrid = a hybrid is a vine whose parents come from two different vine species (typically one parent is American vine).

- Very rarely used in winemaking (Vidal is notable exception)
- Hybrids crucial in grape growing, used as rootstock.

Phylloxera and Rootstock

Phylloxera

- Native to N America
- *V. Vinifera* unable to defend against the insect
- Complex life cycle
 - One phase; **lives underground + feeds on vine's roots. Infections enter through feeding wounds** (and over few years vine weakened/dies)
- American vines (evolved with Phylloxera) - **stop louse by clogging mouth with sap. Also forms a protective layer to prevent secondary infection.**
- Phylloxera all over world - only stopped by strict quarantine.

Rootstocks

- To stop Phylloxera, *v. vinifera* planted onto American rootstock or hybrid
- Specific rootstock also protect against nematodes

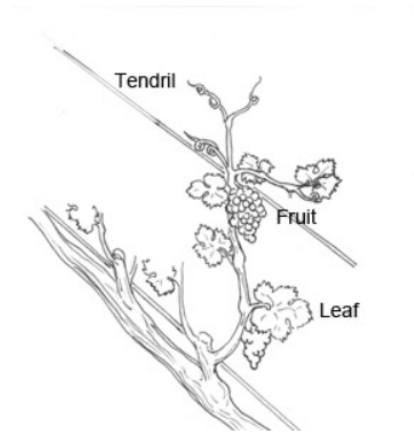
Grafting = Technique of joining a rootstock to V. Vinifera variety.

- **Bench grafting (most popular) = V. Vinifera + rootstock variety joined by machine and stored in a warm environment to fuse. Then vine planted.** (Done in nurseries)
- **Head grafting = Existing vine cut back to its trunk and a bud or cutting of new variety is grafted onto trunk.** (Fruit next vintage = good for established grape growers)
 - Cheaper than replanting the whole vineyard as the root has an established system.

The Anatomy of the Vine

The Green Parts of the Vine

These parts of the vine grow each year. The principal structure is the shoot. Along length of the shoot, there are leaves, buds, tendrils and flowers or berries.



Tendril Vine uses tendril to support the shoot and keep upright. Tendril senses wire trellis and wraps around tightly.	Buds (embryonic shoots) Between leaf and shoot. Matures inside casing throughout season - contains miniature versions of all vine components.
Leaves The plant's engine. Responsible for photosynthesis (water/sunlight → glucose/oxygen). Glucose supports vine growth + sweetens fruit.	Fruits/Flowers and Berries Vine's reproductive organ. Both male _ female parts grouped in <i>inflorescences</i> . Each flower becomes a berry, so inflorescences will be a bunch.

One-year-old wood

Shoots turn woody winter after they've grown. Next spring they become one-year-old wood + buds burst and grow shoots.

Every winter the vine is pruned and one-year-old wood will either be a cane or spur (depending on the number of buds)

Cane (long): 8-20 buds

Spur (short): 2-3 buds

Permanent wood

More than one year's old. Restricted by pruning. Made up of trunk and arm of vine.

The root

Key functions:

1. Absorb water/nutrients
2. Anchor the vine
3. Store carbohydrates

Most *V. Vinifera* grafted onto root systems from other species to stop phylloxera.

Multiple Choice Practice Questions

1) Which part of the vine is responsible for photosynthesis?

- a) Roots
- b) Trunk
- c) Leaves
- d) Canes

2) What is the primary function of the roots in a vine?

- a) To produce flowers
- b) To perform photosynthesis
- c) To absorb water and nutrients
- d) To support grape clusters

3) Which of the following is NOT a key factor influencing grape ripening?

- a) Climate
- b) Soil type
- c) Sunlight
- d) Harvest date

4) What is the purpose of grafting in viticulture?

- a) To increase the leaf area for photosynthesis
- b) To control the height of the vine
- c) To protect the vine from pests like phylloxera
- d) To enhance grape color and flavor

5) Which part of the vine supports grape clusters and helps them reach sunlight?

- a) Roots
- b) Trunk
- c) Shoots
- d) Tendrils

Answers

1. c) Leaves

2. c) To absorb water and nutrients

3. d) Harvest date

4. c) To protect the vine from pests like phylloxera

5. d) Tendrils