How to tame an unruly canopy

After a wet season across much of Australia, particularly on the east coast, some growers have now found themselves with large, unruly canopies and more wet weather on the way, prompting questions about the best way to manage vigorous canopies. In this column AWRI Senior Viticulturist **Robyn Dixon** outlines a variety of canopy management options.

What are the key issues with large, dense canopies?

Dense canopies create cool, shaded conditions that favour pests such as scale, mealybug and light brown apple moth and are ideal for fungal diseases, particularly when conditions remain wet, and make chemical control more difficult. Canopy density can also have an impact on fruit quality, particularly in red varieties, where adequate sunlight exposure is required for the development of flavour, aroma and colour compounds and the degradation of undesirable flavour compounds such as methoxypyrazines. High potassium levels and delayed ripening are also associated with excessive shading within the canopy.

What are the options for managing a dense canopy?

When growers are faced with an unruly canopy close to veraison, practices such as wire lifting, trimming and leaf plucking to open up the canopy can take considerable effort and may increase the risk of sunburn in warm climates or susceptible varieties (e.g. Chardonnay). Ideally, canopy management should start early in the season to allow vines time to acclimatise to the increased sun exposure; however, when rain is on the horizon and bunch rot is a concern, opening up the canopy may be the difference between harvesting a crop or dealing with unacceptable disease levels. When attempting to open up a dense canopy late in the season, care should be taken to ensure that fruit is not over-exposed. Dr Richard Smart (pers. comm. 2022) suggests trimming and leaf plucking on the morning sun side of the canopy (the eastern side in the southern hemisphere) and leaving the western side more shaded to protect fruit from the more intense afternoon sun.

If canopy density is regularly an issue, split canopy training systems such as the Smart Dyson or Scott Henry system described by Smart and Robinson (1991) may be suitable. Simple measurements taken at pruning, such as shoots per metre of canopy and pruning weight per metre of canopy, can help growers determine if splitting canopy is an option (Smart and Robinson 1991).

How can I prevent lateral shoots falling into the midrow, particularly in windy conditions when they all come untucked?

Wire lifting

In mechanised viticulture, where vines are trained onto post and wire trellises, canopy wires can be used to manipulate the direction of canopy growth. Using wires to train the shoots to grow vertically upwards (vertical shoot positioning, VSP) can help maintain accessibility in the vineyard and improve sunlight penetration into the bunches when used in conjunction with trimming and leaf plucking. There are two schools of thought when it comes to canopy wires, the wires can be clipped into place permanently or they can start the season

Get Vintage Ready
with Grapeworks

BOISÉ

Barrel Insert Chain
Extend your barrel life economically with Boisé premium quality barrel inserts.

Flat Bottom VC tanks
High quality Stainless Steel VC tanks made in Italy. Range of flat bottom VC tanks with floating lid and tank kit. **Capacity sizes from 100L to 1500L.**

Cellar, grape handling & cleaning tools

Nally Mega Bins
Square 780 Food grade Polyethylene. Bins can be branded &/or numbered.

Ferment Vats & Covers
Food Grade polyethylene ferment vats, plus breathable and non-breathable covers.
Sizes available in: 225L, 350L, 500L, 700L and 1000L.

Huge range of pumps
Choose from Impeller, LOBE and Flotation models.

Float up to 4x Faster

KTS FLOT® by Martin Vialatte

VEGAN

- Highly effective Flotation and Fining Agent
- Easy to use liquid, 100% plant origin
- Reduces wine loss with a very concentrated cap

PLUS, enquire about the rest of the premium oenological range including, Yeasts, Nutrients, Enzymes, Fining, Tannins, Bacteria and Stabilising products.
Call to organise a trial.

Contact Grapeworks for all your vintage requirements.
03 9555 5500 or info@grapeworks.com.au
View the range at Grapeworks.com.au

grapeworks CONSUMABLES

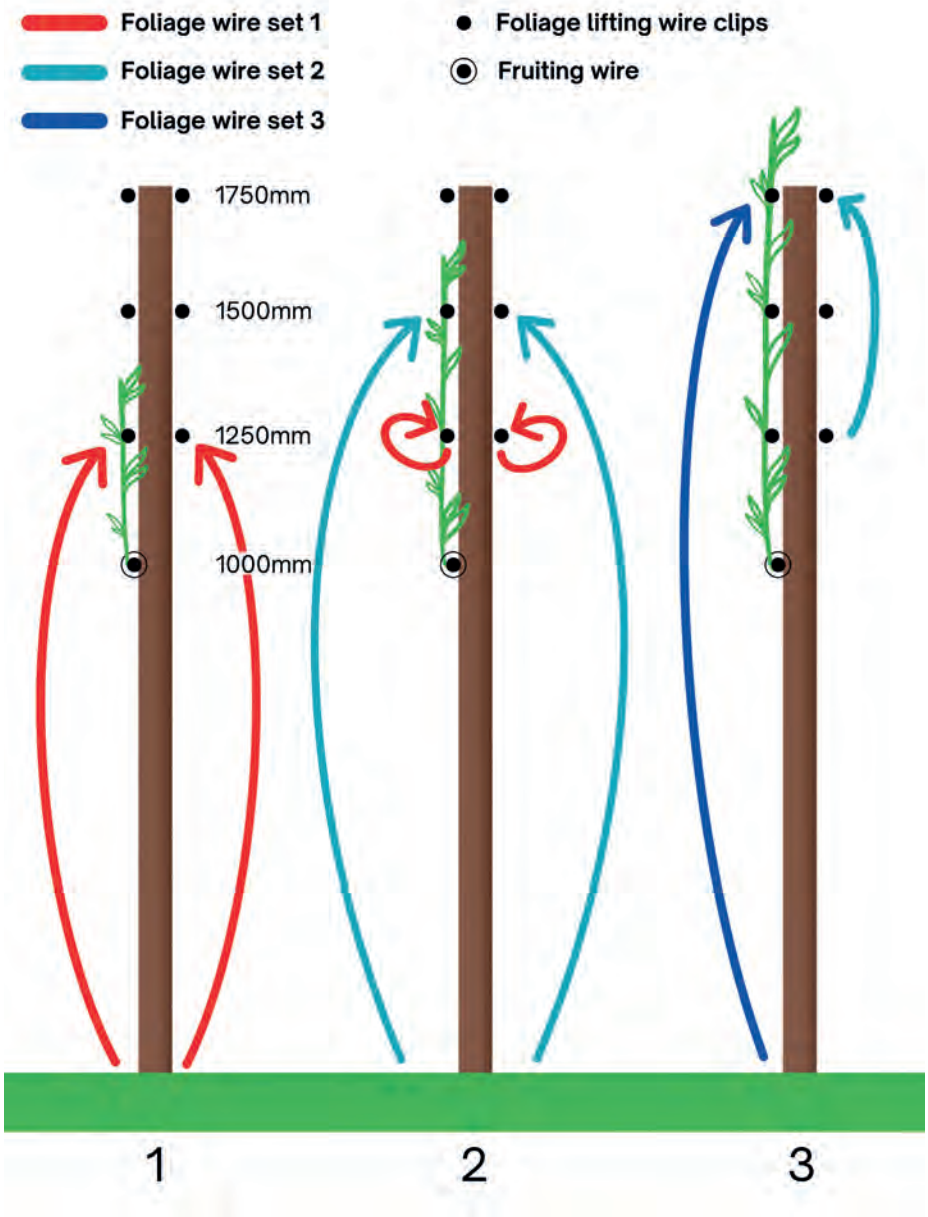


Figure 1. Wire lifting technique

on the ground and be lifted into place as the canopy grows. Experience suggests that the latter produces a more upright canopy and minimises breakage of the shoot tips from wind. Regardless of the technique used, the key to creating a good VSP canopy is to start early.

The steps outlined below describe a tried-and-true method to create a good VSP canopy. The technique uses three foliage lifting wires on the downwind side of the canopy and two lifting wires on the upwind side of the canopy – five foliage wires in total. Growers in less windy sites may be able to get away with two wires on each side. Regardless of the number of wires used, the best results are obtained when three foliage wire clips are positioned on each side of the post between the fruiting wire and the top of the post. The top clip should be positioned about 50 mm from the top of the post and the two other clips at equal distances from the fruiting wire and the top clip. For example, with a post height of 1,800 mm and a fruiting wire height of 1,000 mm, the top clip should be installed at 1,750 mm, the bottom clip at 1,250 mm and the second clip at 1,500 mm (Figure 1).

Wire lifting technique

1. When the shoots have grown about 10 cm above the bottom lifting position, lift the first set of foliage lifting wires into the bottom foliage wire clips on each side of the canopy, tucking the shoots in behind the wires.

2. When the shoots have grown about 10 cm above the second lifting position, unclip the first set of wires, sweep and tuck the shoots in behind the wires and then replace the wires into the first foliage wire clips. In the same pass, lift the second set of foliage lifting wires into the second clip tucking the shoots in behind the wires.

3. When the shoots have grown about 10 cm above the final lifting position, lift the second foliage wire on the upwind side of the canopy into the third (top) clip and the third wire on the downwind side of the canopy into the third (top) clip.

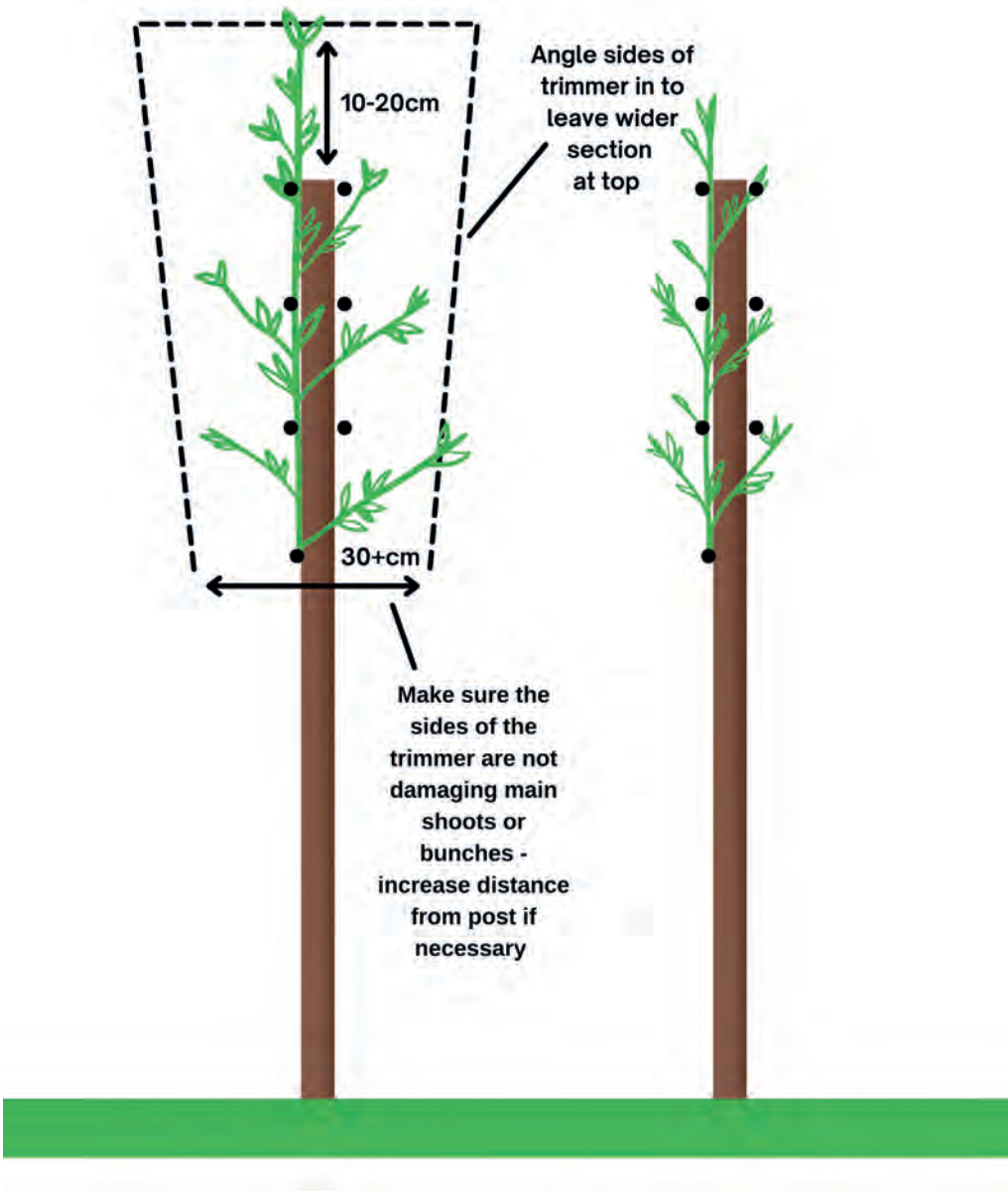
Trimming and topping

Once the wires are in their final lifting positions, the sides of the canopy can be trimmed. Side trimming should only trim the laterals (not the main shoots) and care should be taken to ensure the trimmer is not damaging any bunches. Angling the trimmer so it is narrower around the bunch zone and wider at the top of the canopy will help to open up the canopy around the bunch zone while maximising the leaf area retained for ripening the fruit (Figure 2). In windy sites, side trimming should be done as soon as possible after the final wire lift. Delaying trimming in windy conditions may undo all the work done to get the canopy positioned vertically. An extra sweep and tuck pass (described in step 2 above) may be required to re-tuck the shoots behind the wires.

Once the canopy has grown beyond the top lifting wire, the tips of the shoots can be trimmed (or topped) to prevent the canopy from flopping over. The topping height should be set to ensure that 12-14 leaves remain on the main shoots. Trimming the shoots any lower may lead to excessive lateral growth or may restrict photosynthesis if water and nutrients are restricted. Severe topping pre-flowering can affect fruit set.

In warm climates where sunburn is a concern, growers may choose not to lift the foliage wires up to the top position.

Figure 2. Trimming technique



Instead, they may choose to allow the canopy to flop out once it has reached the middle lifting position. In windy sites, the risk is that the shoots will flop over to one side leaving one side of the canopy more exposed to the sun than the other side. Lifting the wires to the top position and topping the shoots to 12-14 leaves will prevent the canopy flopping to the side.

When is the ideal time to trim?

Ideally, trimming the tips of shoots (topping) should be delayed until after fruit set to avoid excessive lateral growth and to ensure fruit set is not affected. Once the berries have set, the vine starts to redirect its carbohydrates into the developing bunches rather than to shoot growth. However, in situations where shoot growth is extremely vigorous, topping may need to be done pre-fruit set to prevent the canopy from flopping over. Trimming a canopy that has flopped over is difficult and may result in the shoots being cut too short.

How do I manage shoots lying on the ground? If I trim the shoots the fruit may not ripen; however, if I don't then mildew may move in.

The sweep and tuck technique described in step 2 above can be used to lift the shoots up off the ground and in behind the wires. Sweep and tuck the shoots under the bottom foliage wire first and then work your way up the canopy, sweeping and tucking under the second wire next and then finally the third. Working in this order will help to get a good vertically shoot positioned canopy.

Alternatively, a version of the Scott Henry or Smart-Dyson training system described by Smart and Robinson (1991) can be used. These systems rely on a foliage wire being used to train half of the shoots from each vine downwards with foliage wire clips positioned on the post at about 450 mm off the ground to keep the downward facing shoots tucked safely away from mowers/slashers. Trimming the tops off these shoots with a mower is not an issue provided that the shoots are not damaged or cut shorter than 12-14 leaves.

What is the ideal time for leaf plucking around bunches? Is it better to wait for fruit set or is it ok to start early?

In very dense canopies when wet conditions are likely, leaf plucking of the bunch zone may be required to open up the canopy sufficiently. For the best results, leaf plucking should be performed as soon as possible after the canopy has been wire lifted and trimmed. Leaf plucking should remove one to two leaves from each shoot around the bunch zone. Delaying leaf plucking after trimming may give the laterals a chance to grow which can make it difficult to get close enough to the main shoots to remove the main leaves around the bunches effectively. Once the canopy has been leaf plucked, good spray penetration into the bunches can be achieved with pre-bunch closure sprays.

For further information about canopy management, contact the AWRI helpdesk on (08) 8313 6600 or helpdesk@awri.com.au

Reference

Smart, R.E., Robinson, M. 1991. *Sunlight into wine: A handbook for winegrape canopy management*. Winetitles: Adelaide.

Acknowledgements

Dr Richard Smart provided invaluable canopy management advice to the author when she was part of the viticulture team at Delegat in New Zealand and Australia. His knowledge and expertise are greatly appreciated.