



Converting cane-pruned vines into six vertical cordons or 6V vines

BACKGROUND

The Next Generation Viticulture programme (NGV) designed a novel training system – The Vertical Cordon Training System – to help reduce vineyard operational costs such as trellis work, top and side trimming, leaf plucking, and pruning while enhancing grape quality through better sunlight exposure, airflow, and reduced disease impact. The training system consists of two permanent horizontal cordons and a set number of vertical cordons, from six to 12. The number of vertical cordons is determined by vine spacing, the site's soil fertility potential, production objectives, and vineyard management practices. This factsheet describes the steps necessary to successfully convert cane-pruned vines into six vertical cordons in established vineyards on a VSP trellis with 1.8 m vine spacing. Based on four seasons of research on Sauvignon blanc, Riesling, and Lagrein, the vertical cordon system showed great potential to deliver viticultural benefits such as reduced vine vigour. However, it might not be suitable for mature cordon-trained spur-pruned vines. The conversion from the cane pruning system to the vertical-cordon-trained pruning system occurs in winter during pruning and in spring after budburst and may take up to four seasons.

MATERIALS

The conversion process requires traditional pruning equipment and tools, including secateurs and loppers (only in the first winter), as well as standard personal protective equipment (PPE) worn during pruning operations (safety glasses, gloves, boots, high-viz). Additional required tools are steel clips to secure vertical canes and cordons on the trellis and anchor bands to secure horizontal cordons (Fig. 1).

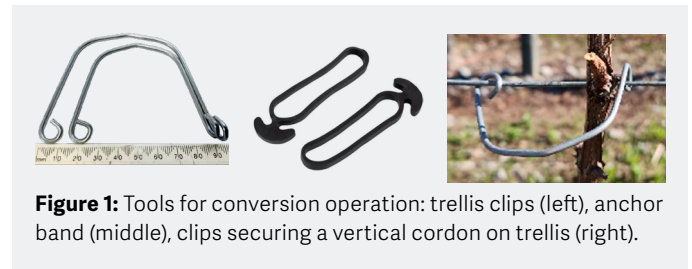


Figure 1: Tools for conversion operation: trellis clips (left), anchor band (middle), clips securing a vertical cordon on trellis (right).

PROCEDURE

First season of conversion – reshaping the vine framework

In the first winter of conversion, vines that were previously pruned to two, three, or four canes carry two to four two-year-old horizontal cordons (Fig. 2A).

- The horizontal cordons on the top fruiting wire are cut and removed, keeping the bottom two horizontal cordons on the bottom fruiting wire (Fig. 2B).
- Three upright canes are retained on either side of the vine head and cut back halfway to the top foliage wire (Fig. 2C).
- The six upright canes should be evenly spaced at approximately 30cm, both along the cordon and between vines.
- Leave one two-node spur between two upright canes and optionally one two-node spur on either side of the vine head.
- Each upright cane is secured on the top fruiting wire (which is usually fixed and permanent) with a steel clip (Fig. 1).
- After budburst, leave the top shoot and thin every second shoot down the vertical cane while removing double shoots.
- Each upright cane should carry no more than six shoots, and the total number of shoots per vine should range between 42 and 48.
- If the site fertility cannot accommodate this shoot load, consider reducing the spur length on horizontal cordons (between upright canes) to one node and/or keeping fewer shoots per upright cane.

Note 1: If the vineyard is three- or four-cane pruned and vines show signs of low vigour (with many spindly canes on the bottom cordons), or canes are affected by fungal diseases such as *phomopsis*, preparing the vineyard for conversion might be necessary. The **preparation for conversion** requires pruning the vines to two canes to get a pool of healthy and adequate vigour shoots from which to select the six upright canes the following winter. It also enables proper setup of the horizontal cordons by loosely wrapping the two canes, or by simply holding them to the bottom fruiting wire with anchor bands.

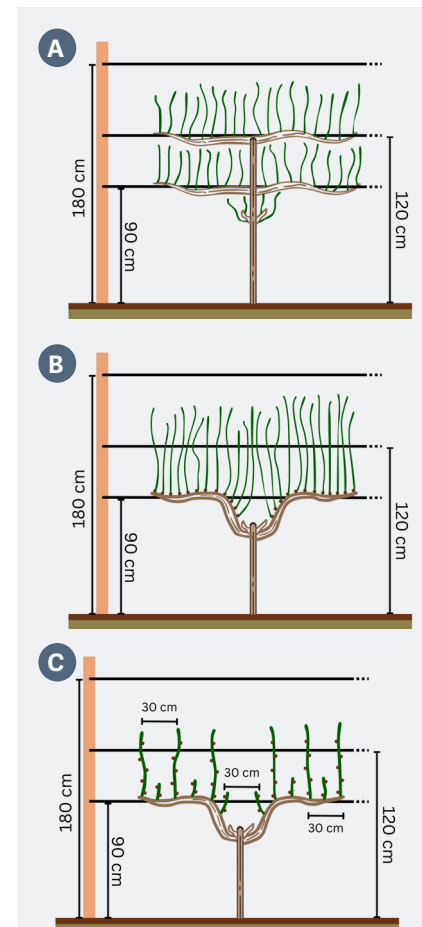


Figure 2: Reshaping the vine in the first winter of conversion



Second season of conversion – Developing the vine framework

In the second winter of conversion, the structure of the vine is made up of six vertical cordons¹ and two horizontal cordons. The bottom half of the vertical cordon is two-year-old wood, and the top half is a cane (Fig. 3A).

- The top cane of the vertical cordon is clipped to the top foliage wire (which will be fixed and tensed permanently) and trimmed slightly above it (Fig. 3B).
- Canes arising from the lower part of the cordon are spurred to two nodes (Fig. 3B).
- Canes growing on the horizontal cordon are also two-node spurred, ensuring there is only one two-node spur between two vertical cordons (Fig. 3B).
- After budburst, every second shoot growing from the top cane of the vertical cordon is thinned. Thinning is unnecessary for shoots growing on spurs at the bottom half of the vertical cordon.
- Each vertical cordon should carry no more than five two-node spurs at the bottom half and no more than five count shoots at the top half. The total number of count shoots should be about 100 per vine.

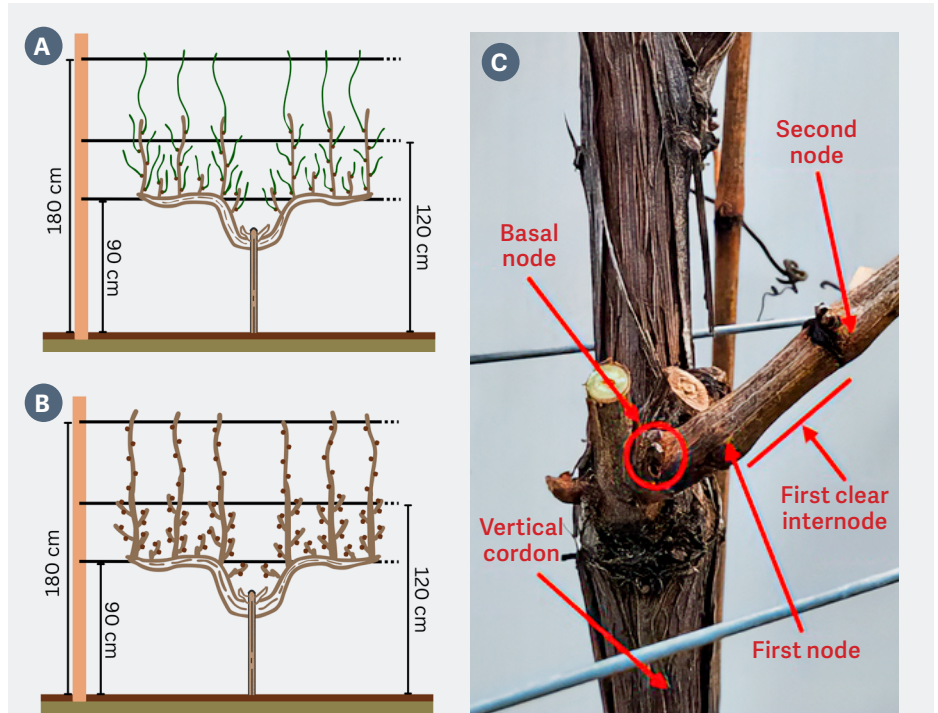


Figure 3: Vine shape in the second winter of conversion and two-node spur characteristics

Note 2: There is no universal rule in counting the number of nodes on a spur, leading to different results when determining the vine's retained node number. To maintain consistency across vineyards, it is recommended to follow a clearly defined, easy-to-implement rule. Within NGV, the basal node (located at the junction of the spur and the cordon) is considered non-count and not included in the count (Fig. 3C). The first count node is the one directly above it when the first internode is about 2 – 4 cm long or about the width of your index and middle finger stuck side-by-side (Fig. 3C).

Third winter of conversion – Completing the vine framework

In the third winter of conversion, the final shape of the vine is achieved with six fully formed vertical cordons extending from two permanent horizontal cordons (Fig. 4A).

- From the third winter forward, pruning consists of leaving two-node spurs on vertical and horizontal cordons (Fig. 4B-C), and shoot thinning is now unnecessary.

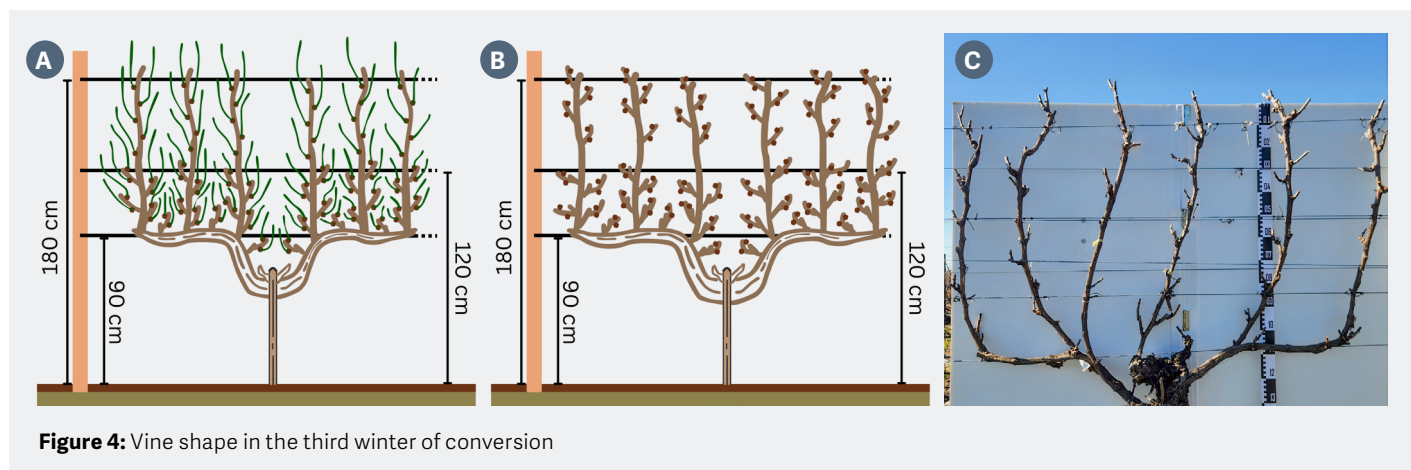


Figure 4: Vine shape in the third winter of conversion

¹ In the second winter of conversion, the upright canes have thickened, lignified and are two years old, thus the term *vertical cordons* as they will become part of the permanent structures of the vine.



- Each vertical cordon should now carry no more than ten spur sites and ideally between six and eight two-node spurs. The total vine count node should range between 100 and 130.
- The pruning of Vertical Cordon Trained vines must prevent “spur castling” by ensuring that the spur site always remains closer to the cordon (Fig. 5).

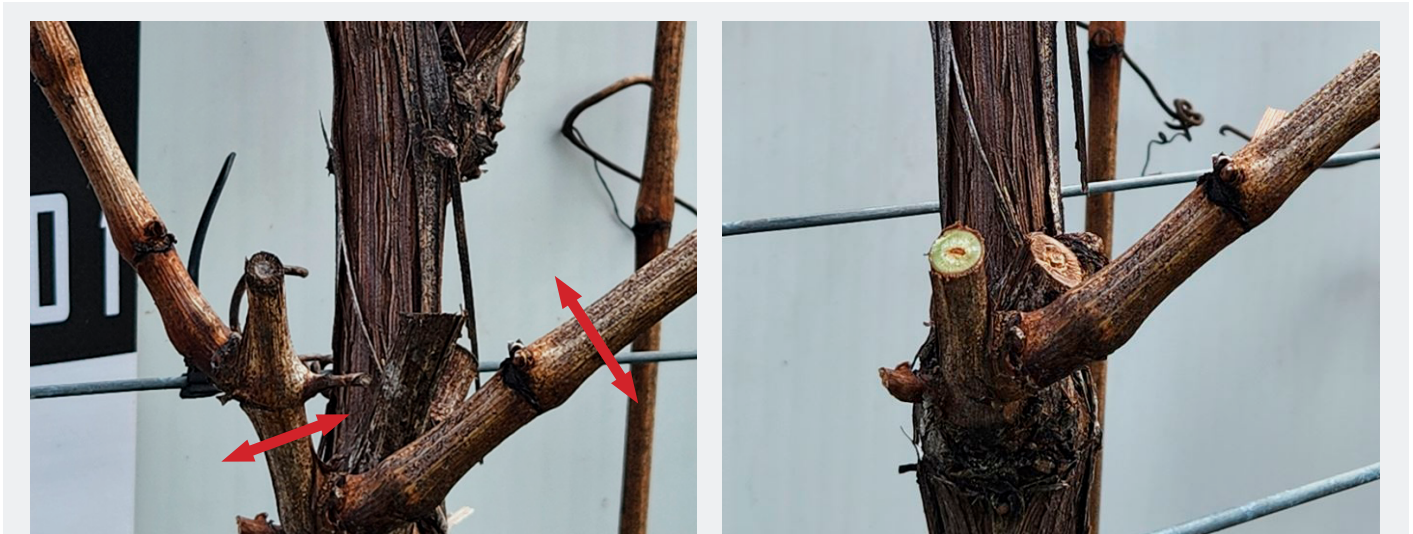


Figure 5: Vertical cordon spur pruning method. Left – First cut at the internode of the old spur to remove the top cane, and second cut at the second clear internode of the bottom cane. Right – New two-node spur close to the vertical cordon.

FURTHER READING

[Season one viticulture results from the Next Generation Viticulture Programme – popular article.](#)

Further information is available on the [Next Generation Viticulture programme page](#).

ACKNOWLEDGEMENTS

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