

# Pruning Dormant Grapevines

Fran Pontasch and Justin Scheiner

Department of Horticultural Sciences, The Texas A&M University System

Dormant grapevine pruning is the most influential of all vineyard management tasks. The concept is simple—the canes that produced fruit the previous year are pruned back (usually to two buds), and the remaining canes are pruned away entirely. However, mastering the task takes years of practice as it is based on vine performance of the previous season and includes a plan to improve performance for the ensuing season.

During the growing season, developing fruit competes with shoot and leaf growth for energy. Skillful pruning regulates fruit and vegetative growth so that the vines' optimal capacity is reached. As the vines mature, they reach an equilibrium between fruit production and vegetative growth. This equilibrium (vine balance) allows the vines to self-regulate and ultimately positively impacts wine quality.

## Pruning Process

In mature vines, the pruner begins by pruning away dead, diseased, or crowded wood. This process cleans away non-functioning and unwanted wood, leaving behind the fruit-bearing canes from the previous season. The ideal fruit bearing cane is healthy with a length of at least 4 feet and a diameter between  $\frac{1}{4}$  and  $\frac{1}{2}$  inch. (Fig. 1)

## Pruning by Bud Number

Buds originate from nodes at the base of each cane and at each node along the length of canes. The bud at the base (basal bud) is typically unfruitful. The lower two buds on healthy canes are typically the most fruitful. Therefore, the lower two buds should be left alone as the upper wood of the canes is pruned back (Fig. 2). One cane bearing two clusters will form from each of the two buds. Count-



Figure 1. All unwanted wood growth has been removed from the horizontal cordon. Healthy fruit-bearing canes have yet to be pruned. The spurs are appropriately spaced to allow air and light penetration through the canopy.

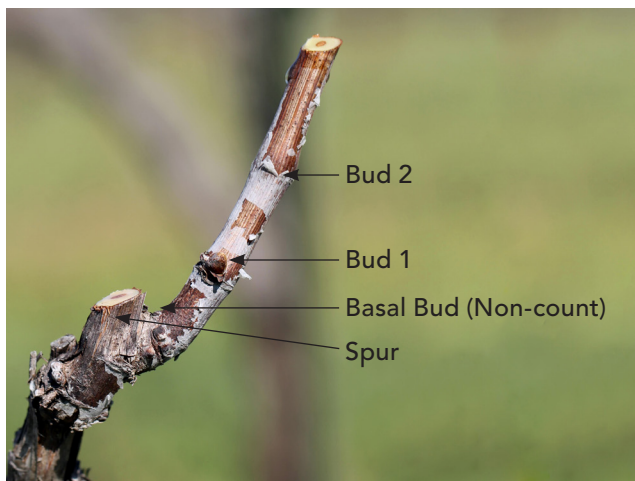


Figure 2. Pruned cane showing bud (node) number.

ing buds allows a rough estimation of the number of clusters the vines will produce and therefore an early estimation of yield.

### Spur Pruning

Grapevines in Texas are typically trained to retain either one or two permanent trunks with two to four horizontal arms (bilateral cordons), and spur-pruned. Spur-pruning is the most common method of pruning wine grapes and grape varieties with fruitful basal buds and can be adopted to most trellis and training systems. In addition, spur pruning is easier to communicate to workers and less time consuming. Therefore, further pruning information regards spur pruning.

Fruitful canes grow from spurs that are strategically positioned along the length of the cordons (Fig. 3). Therefore, the fruitful canes of spur-pruned vines are typically cut back to two fruitful buds. In most varieties, the base bud is not fruitful. Therefore, the base bud is not counted when pruning and may be referred to as a non-count bud. Each fruitful bud produces one shoot with two clusters. Spurs should have roughly 5 inches between them to encourage the development of an open canopy.



Figure 3. Mature spur pruned vine.

### Balance

Grapevines **pruned severely** grow fewer fruit-bearing shoots. When pruned too severely, shoots will lack adequate competition for energy-filled carbohydrates and produce less fruit (under-cropping). This results in an excessive amount of rapidly growing shoots. The excess shoot growth creates shading, a major problem with two-fold consequences. Shading limits air ventilation within the fruit zone, increasing the likelihood of fungal disease. It also prevents sun penetration within the canopy. Buds developing in the shade lose their fruitfulness in subsequent years. Shading can also delay ripening and sugar accumulation leading to herbaceous or “green” flavors in the wine.

Conversely, grapevines **pruned lightly** with many buds left on the vine will grow many cluster bearing shoots. Too many shoots bearing clusters for the vine size results in over-cropping. In over-cropped vines, the ripening clusters compete with the shoots for much needed carbohydrates. The shoot growth tend to be weak, thereby inadequately able to supply the carbohydrates needed to fully ripen the excess number of clusters. In addition, weak shoots often leave clusters fully exposed to the Texas summer sun. Sunburned fruit does not finish well in the winery.

A balanced vine will have strong but not overly vigorous cane growth. Using a balanced pruning formula helps the pruner measure the per vine ratio of weights of pruned cane wood to weights of harvested fruit (Kliewer, Casteel, 200). A vine should produce strong but not overly vigorous shoot growth and be capable of fully ripening the fruit it is bearing. Such a vine is said to be balanced, as the amount of fruit balances the shoot growth. We can calculate the relationship of vegetative growth to fruit load, or crop load, by dividing the vine's yield by the weight of its dormant pruned canes. By regularly recording the ratio, we can use the calculations in two ways: Current harvest weight divided by following season's pruning weight gives us the crop load calculation or Ravaz Index; or, use harvest weight divided by the same season's pruned weight or Growth-Yield Relationship. A ratio's goal is a range 5-10, where below 5 represents an over cropped vine, and above 10 represents under cropped vine.

### Timing

Pruning "wakes" the vines and triggers an invigorating response which can initiate bud break. A bud break that occurs too early in the season can expose tender buds and shoots to damaging late spring frost. Research indicates that delayed pruning translates to a corresponding delay in bud break. The onset of pruning must be scheduled so



Figure 4. Symptom of Grapevine Canker Disease

that the scope of work is completed before bud break, yet after the last spring frost.

Research also indicates that delaying the onset of pruning can reduce the exposure of pruning wounds to several fungal pathogens that can infect the wood. Fungal pathogens that infect grapevine wood (Grapevine Canker Disease) causes poor shoot growth, reduced fruit yield, vine decline, and eventually vine death (Figs. 4 and 5). There is no known cure for Grapevine Canker Disease. Pruning should be limited to dry weather to hinder the opportunity for fungal spores to splash onto fresh pruning wounds.

To avoid wood rotting cankers:

- Prune during dry weather.
- Delay final pruning until closer to the time of bud break.
- Remove and burn any infected wood to prevent re-infection.
- Apply Rally 40WSP and Topsin M to pruning wounds immediately after pruning to prevent the spread of canker infection.

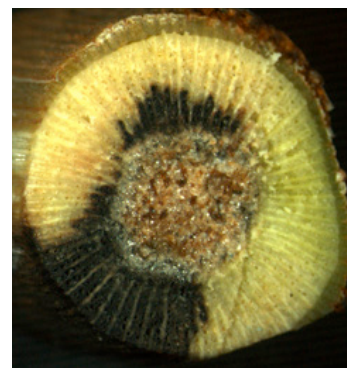


Figure 5. Cross section of Cankered Wood

### Double Pruning

It can be difficult to completely prune a vineyard before bud break and after the risk of frost has passed. Double pruning can help with this time crunch. Double pruning involves indiscriminately hedging dormant canes early during dormancy, leaving four to six buds on all canes and removing tangled portions of the vine from the trellis wire. This job can be accomplished by unskilled laborers. Once the vines are closer to the desired time for bud break, skilled pruners can judiciously fine

prune the vines without the hindrance of tangled canes. Applying fungicides after hedging is only necessary after fine pruning.

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