

Section 2: Vineyard Establishment

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- Soils
 - ◆ Structure
 - ◆ Water Holding Capacity



Rootings

- The easiest way to propagate grapes
- The greatest success comes with getting plants to produce roots before shoots
- Step 1 - Cut pruning wood in 30-40 cm sections
 - ◆ Time – late spring before bud break
 - ◆ Size - large diameter canes are preferred
 - ◆ Cuts – flat on base, 45 degree on top



Rootings (continued)

- Step 2 - Store upside down, under 15-30 cm of moist sand or sawdust
 - ◆ After 2 wks at 27C or 4-5 weeks at 16C roots will form
- Step 3 - Turn cuttings right side up and plant
 - ◆ No more than 2-3 buds above soil line



Layering

- An easy way to replace a missing vine
- A cane is buried at the missing site



Benchgrafting

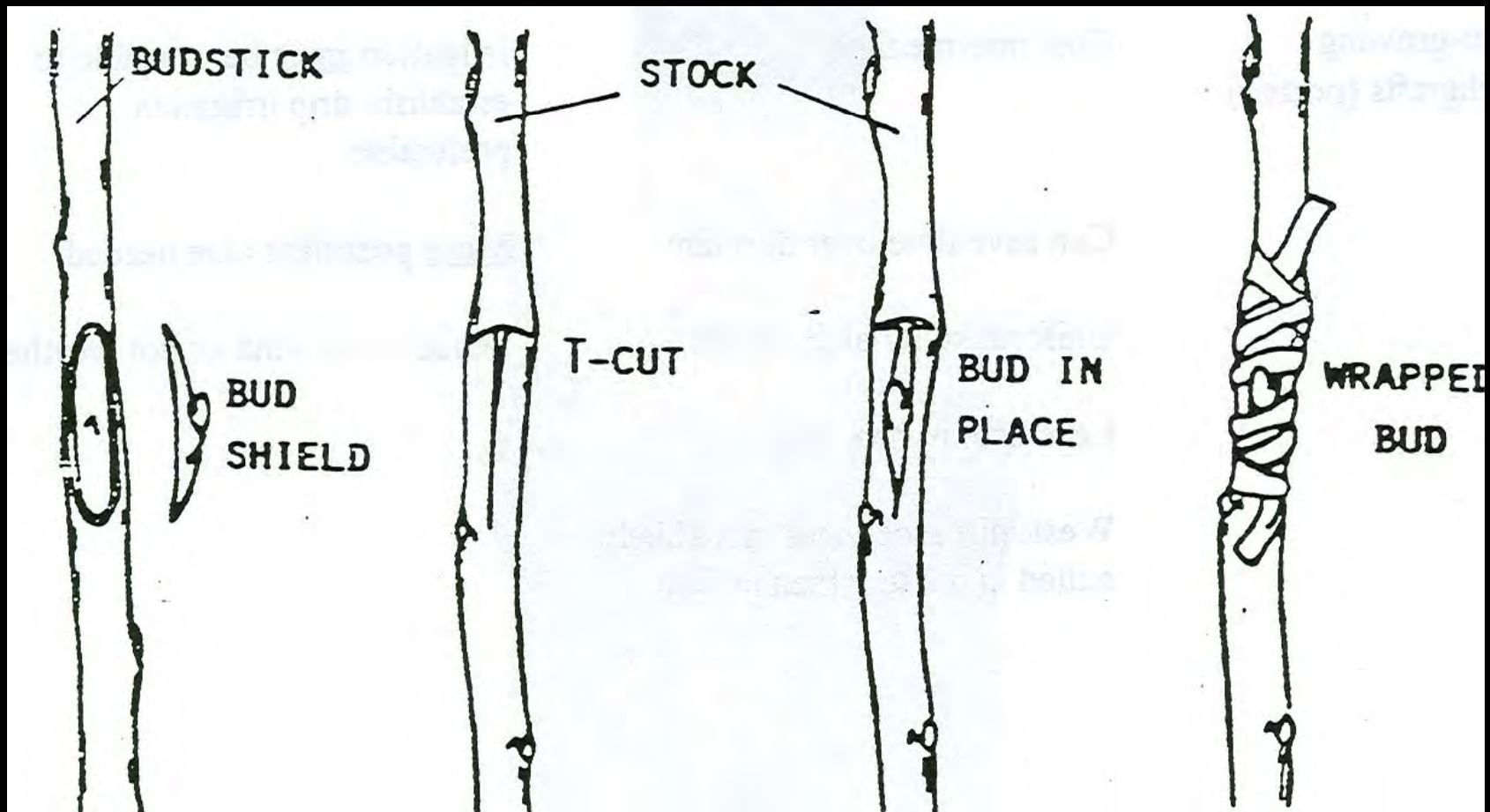
- Two canes of similar size are cut to fit together like a jigsaw puzzle, then planted
- Allows selection of a different top and bottom
 - ◆ To manage vigor
 - ◆ To provide greater resistance to Phylloxera

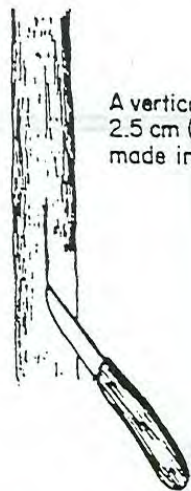


Converting Existing Vineyards

- Young vines (often a rootstock used for resistance to nematodes or phylloxera)
 - ◆ T budding – a bud is put under the bark in the spring
- Older vines (to convert to a new variety)
 - ◆ Cleft Grafting – the top is removed and a wedge shaped piece of the new selection is placed in groves on either side of the slot created with a wedge

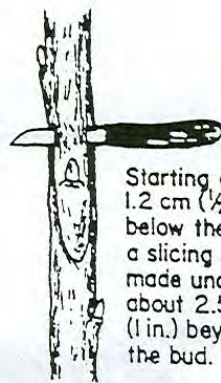
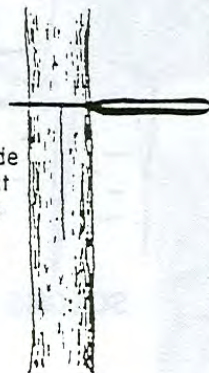






A vertical cut about 2.5 cm (1 in.) long is made in the stock.

A horizontal cut is made through the bark about one-third the distance around the stock. The knife is given a slight twist to open the two flaps of bark.

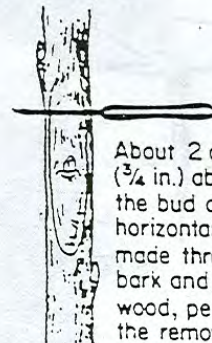


Starting about 1.2 cm (1/2 in.) below the bud, a slicing cut is made under and about 2.5 cm (1 in.) beyond the bud.

Front view



Side view



About 2 cm (3/4 in.) above the bud a horizontal cut is made through the bark and into the wood, permitting the removal of the bud piece.

INSERTING THE BUD INTO THE STOCK



The shield piece is inserted by pushing it downward under the two flaps of bark



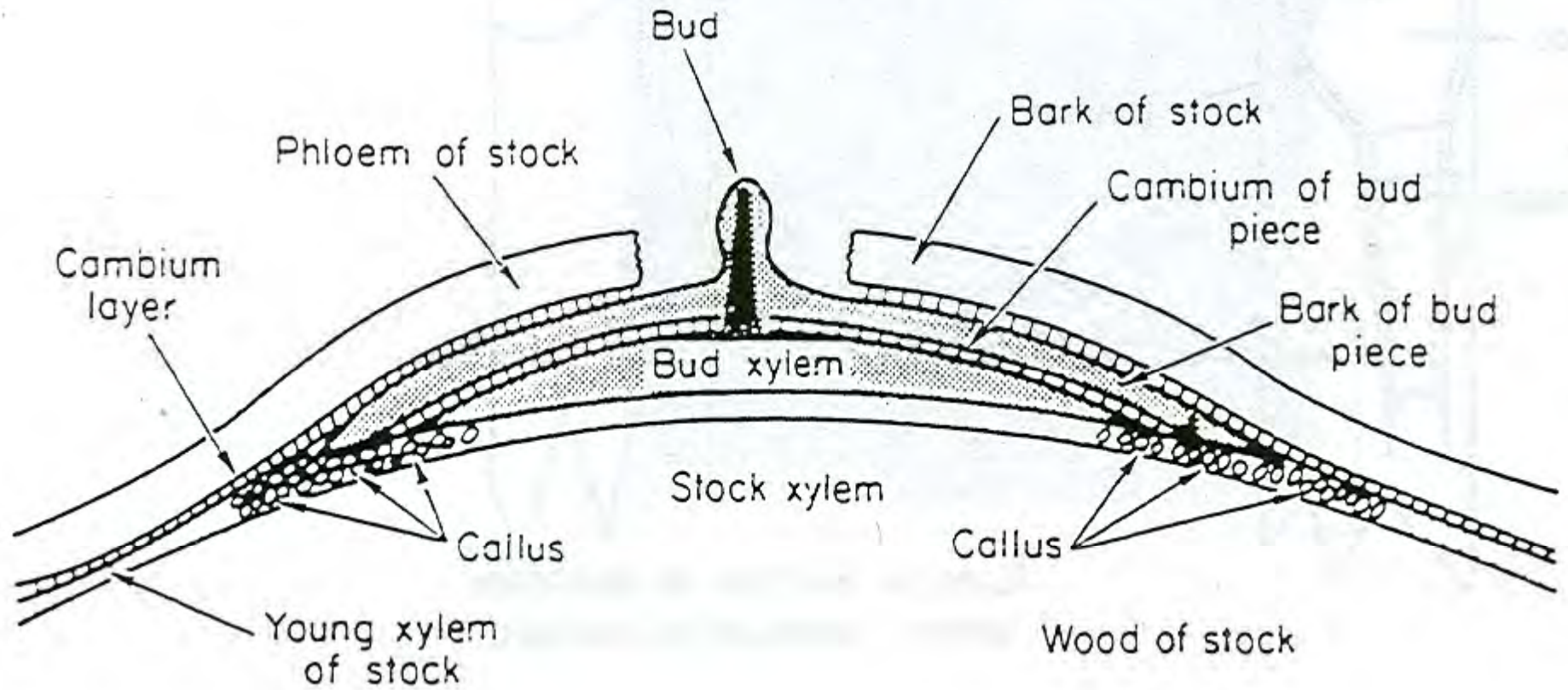
until the horizontal cuts on the shield and the stock are even.

The bud union is then tightly tied with some wrapping material.



Basic steps in making the T-bud (shield bud).

CROSS SECTION THROUGH INSERTED T-BUD





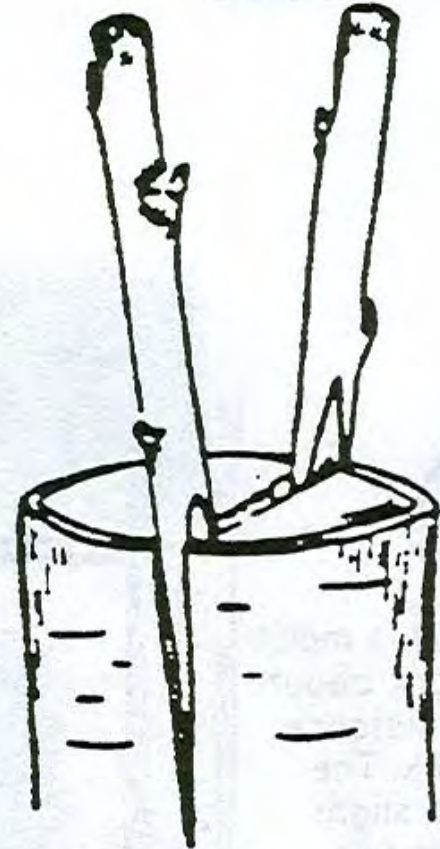
SCION

WEDGE



CLEFT

STOCK



SCIONS IN PLACE

Vine Spacing Considerations

- Vines should be spaced to intercept maximum light because light = energy
- Vine spacing comes in three dimensions
 - ◆ Space between rows
 - ◆ Space between vines within rows
 - ◆ Height of trellis
- Vineyard row orientation
- How to layout a vineyard



Space Between Rows

- Determined by the distance needed for
 - ◆ Cultural practices and harvest
 - ◆ Generally as narrow as possible
 - ★ Maximize water use efficiency
 - ★ Maximize yield per unit for land
- A 1:1 ratio of distance between rows and canopy height is ideal



Space Between Vines in Rows

- Determined by vigor of the vines and desired vine size
 - ◆ Vigorous vines – more distant
 - ◆ Less vigorous vines – closer together
- Vines at full maturity should touch each other to
 - ◆ Fully utilize space
 - ◆ Maximize yield per unit of space



Vine Height

- Should be high enough to
 - ◆ Intercept light
 - ◆ For convenient and efficient harvest
 - ◆ To reduce disease incidence



Light Inception

- If a canopy is 3m high and rows are .5m apart the vine canopy can intercept 90% of the light
- If the canopy is 1m high and rows are .5m apart the vine canopy can intercept only 50% of the light
- Increase canopy height increases the opportunity for the fruit to be exposed to sunlight in early growth stages, increasing berry size



Convenient and Efficient Harvest

- Vine height should place fruit about 1.5m high for convenient harvest
 - ◆ Lower height fruit harvest increases labor effort and cost
 - ◆ Higher height fruit harvest requires more costly trellising



Reducing Disease

- Anthracnose spores over winter in debris on the vineyard floor
 - ◆ Raising the trellis height makes splash dispersal of fungus spores and disease spread more difficult



Row Orientation

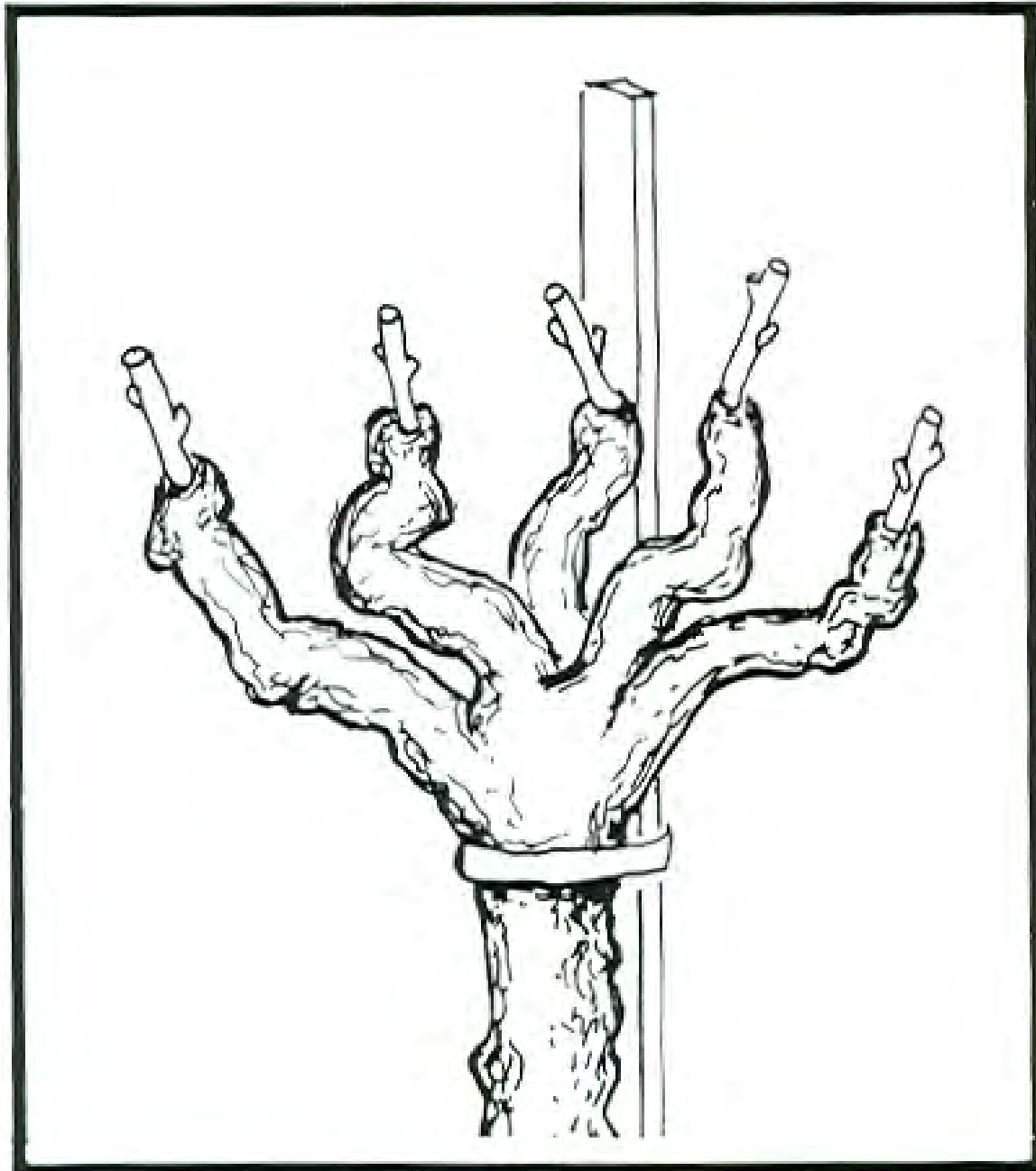
- North to South is better than East to West
 - ◆ Both sides of the vine get roughly equal light
- Fine tune orientation to have minimal shadow in the row during the June 21st summer solstice



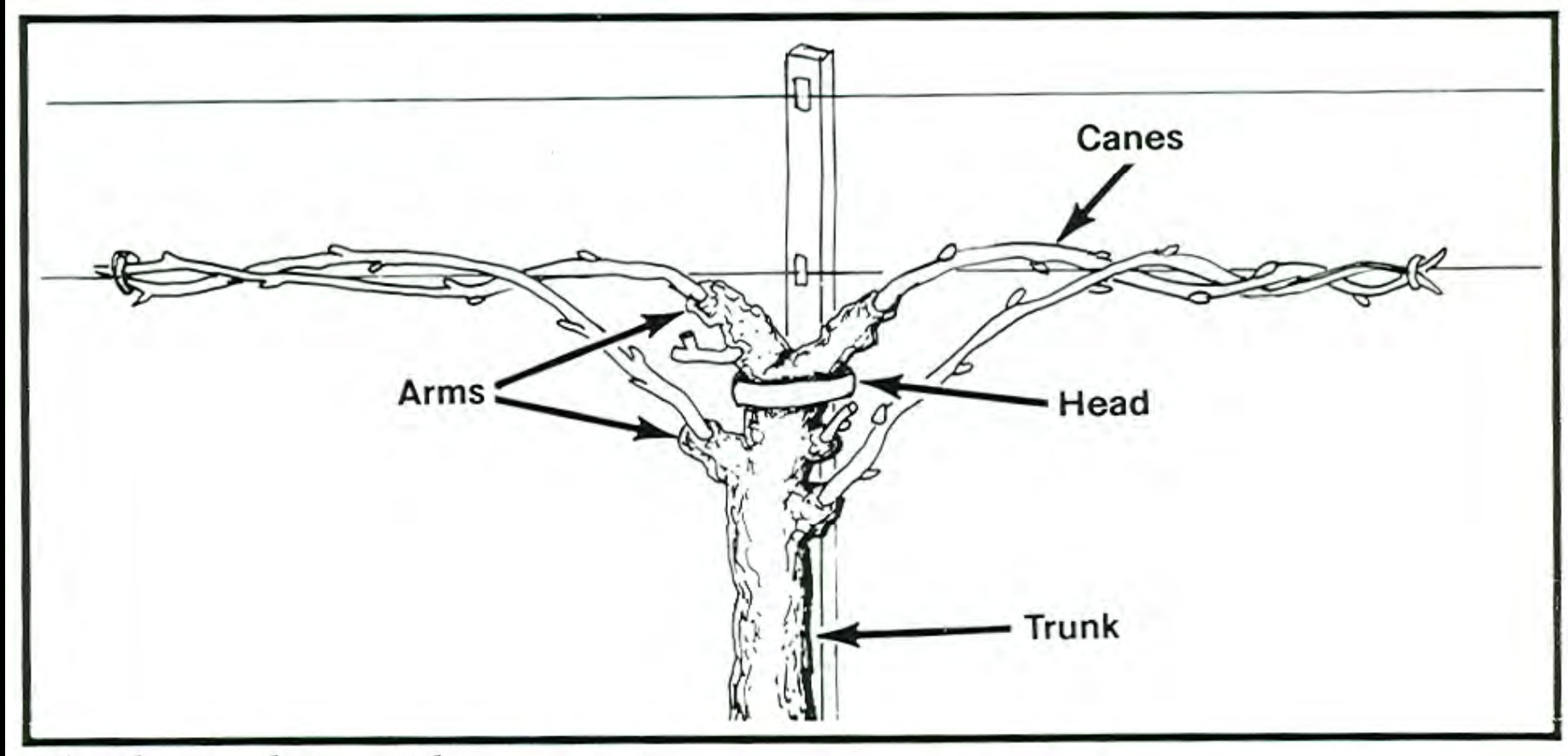
Trellises

- Head-trained
- Head-trained with cane pruning
- Bilateral cordon with spur pruning
- Quadralateral cordon training with spur pruning

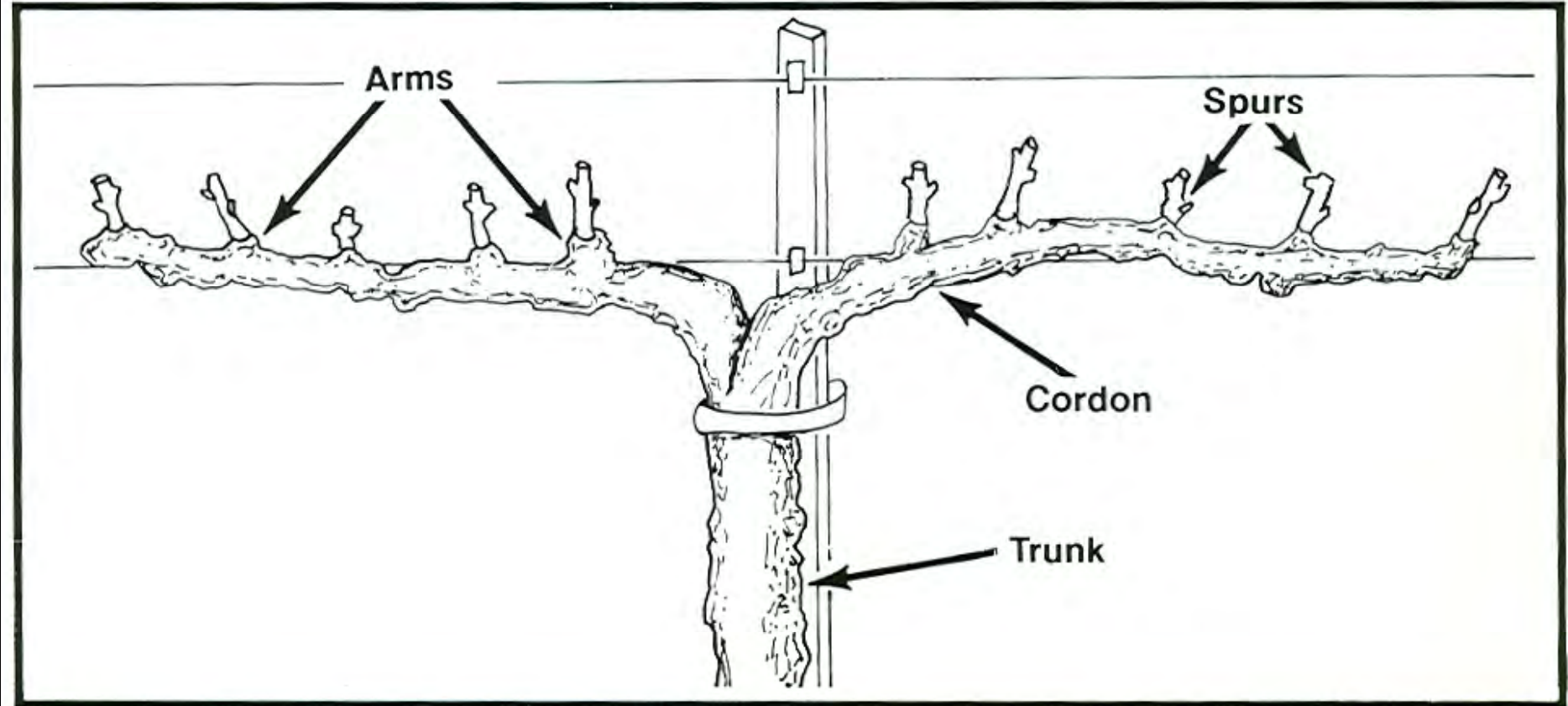




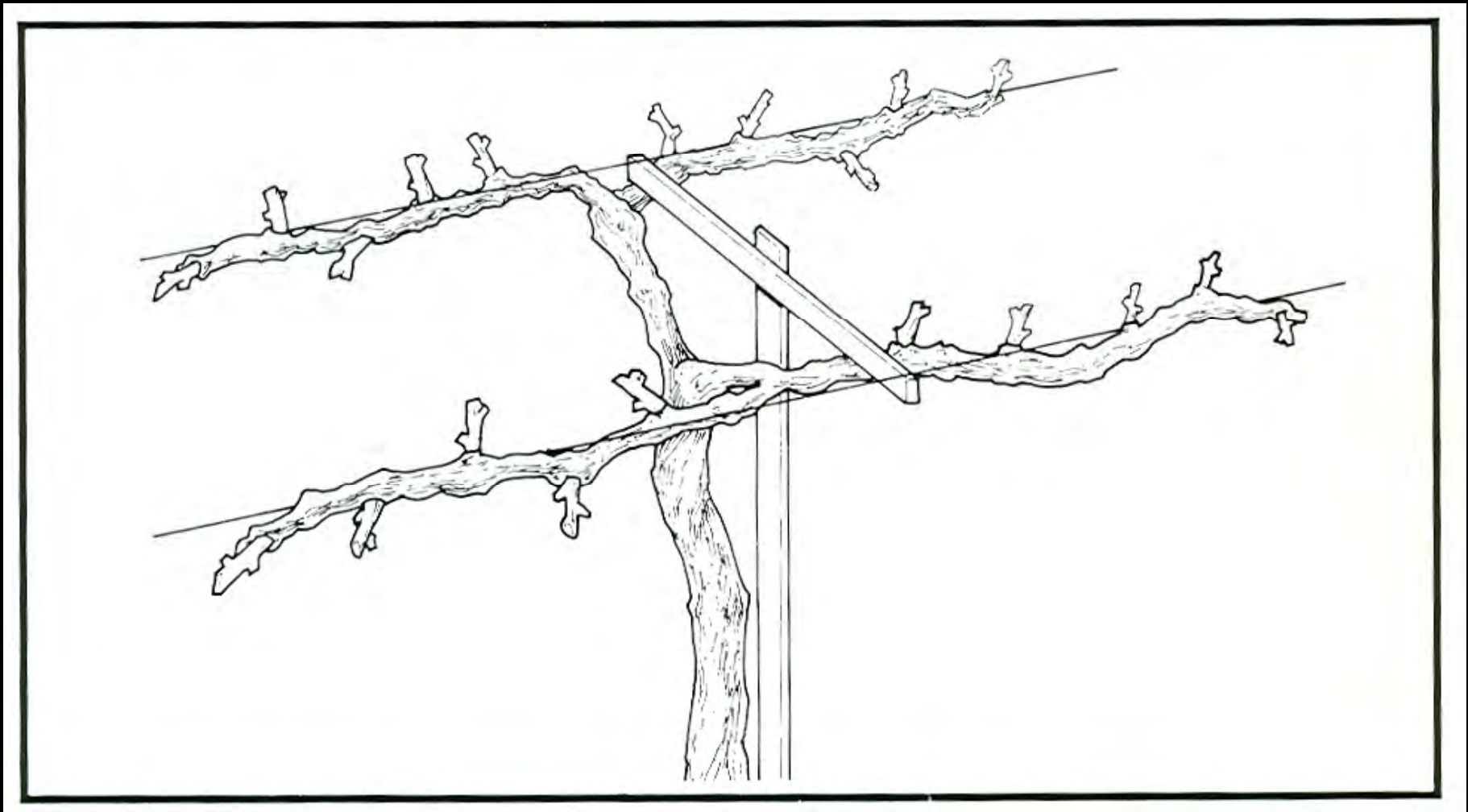
Head –
Trained
Grapevine



Head-trained with cane pruning



Bilateral cordon with spur pruning



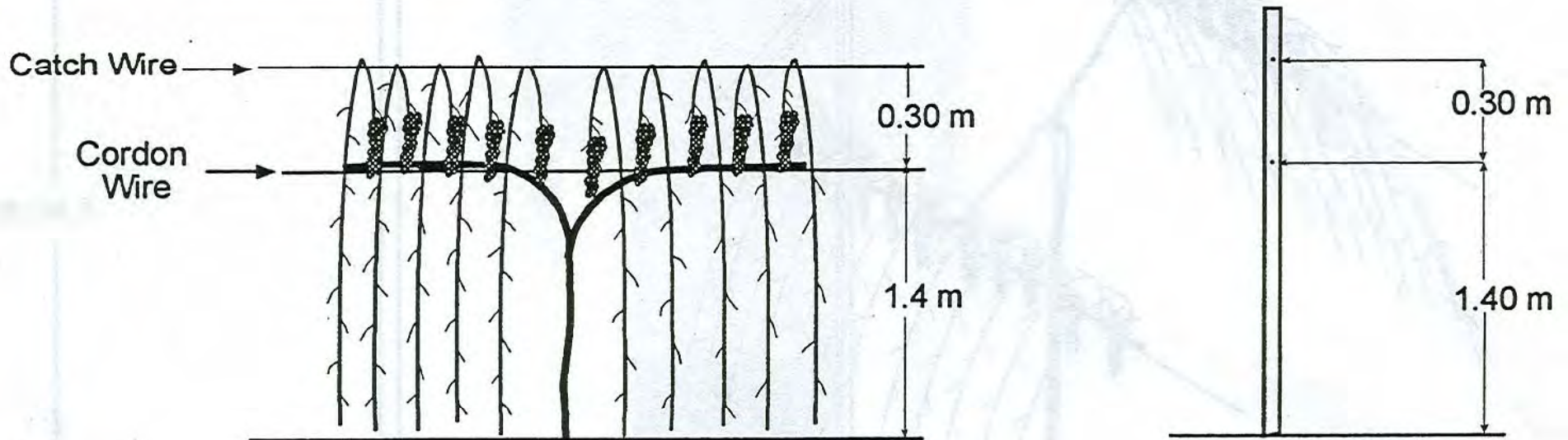
Quadralateral cordon with spur pruning

Types of Bilateral Cordon Systems

- California sprawl
- Vertical shoot position (VSP)



Traditional Single Curtain California Sprawl





Vineyard Management

Management by years

- ★ 1st year
- ★ 2nd year
- ★ 3rd year
- ★ 4th and more year



Management of New Vineyards

- 1st year
 - ◆ Prune to two buds
- The young plant will be stronger the 2nd year if pruned properly the 1st year



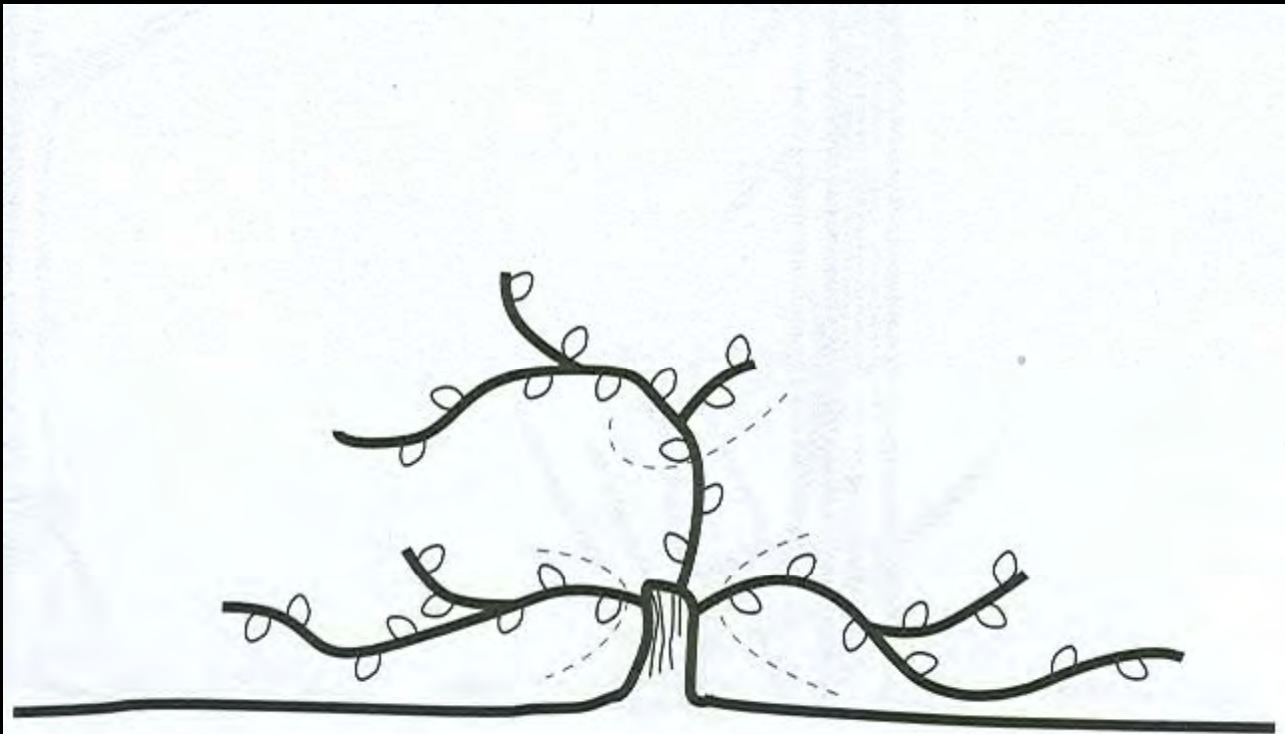


Figure 10.1 Winter of first year. Prune to two buds.

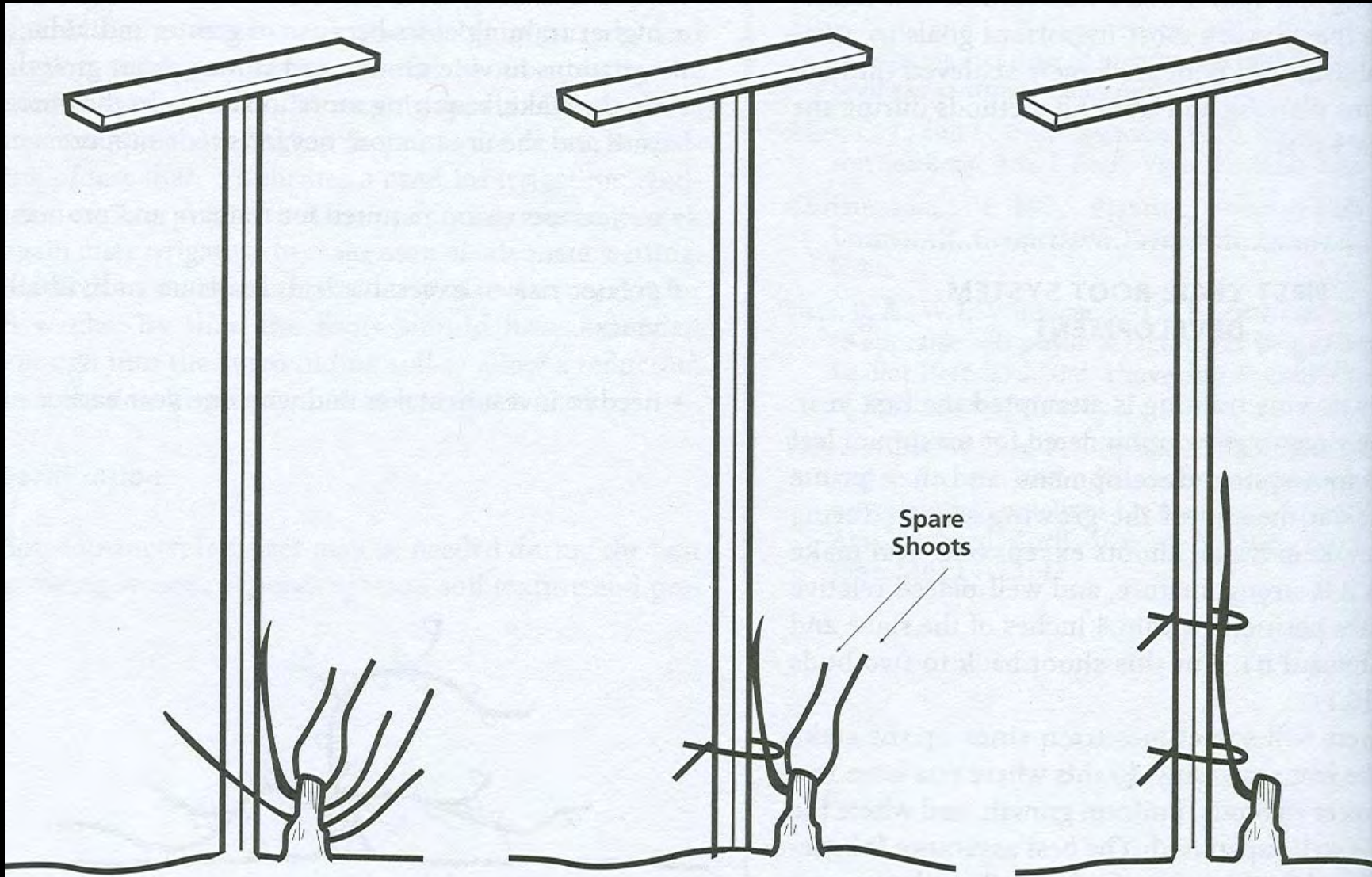


Figure 10.2 Spring of second year. Initial shoot growth before selection.

Figure 10.3 Spring of second year. Select a main shoot and leave two spare shoots.

Figure 10.4 Spring of second year. The main shoot is selected and the spare shoots are removed.

Why Head Prune with Canes?

- Less fruitful basal buds



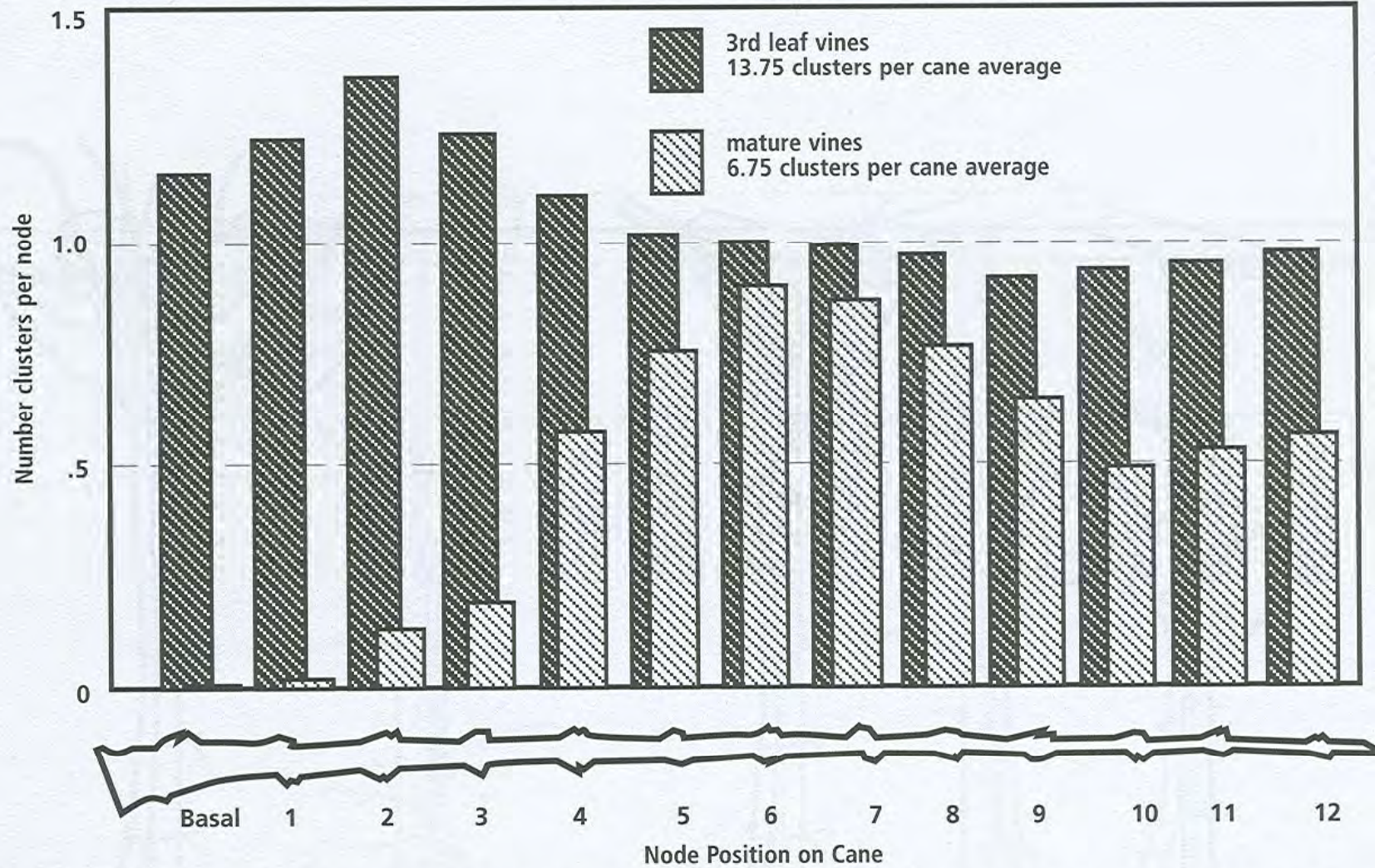


Figure 10.9 A comparison of highly fruitful third-leaf vine canes (of lateral shoot origin) with those of mature vines (of primary shoot origin). 'Thompson Seedless,' basal through twelfth node positions.

Management of New Vineyards - Head Pruned with Canes

- ◆ Later in the 2nd year
 - ★ Remove lateral shoots
 - ★ Head vines low as “they will creep up on you”
 - ★ Proper height allows for ease of placement of canes on wires and sun canes for next year’s crop
 - ★ Leave two canes and some renewal spurs for the third year



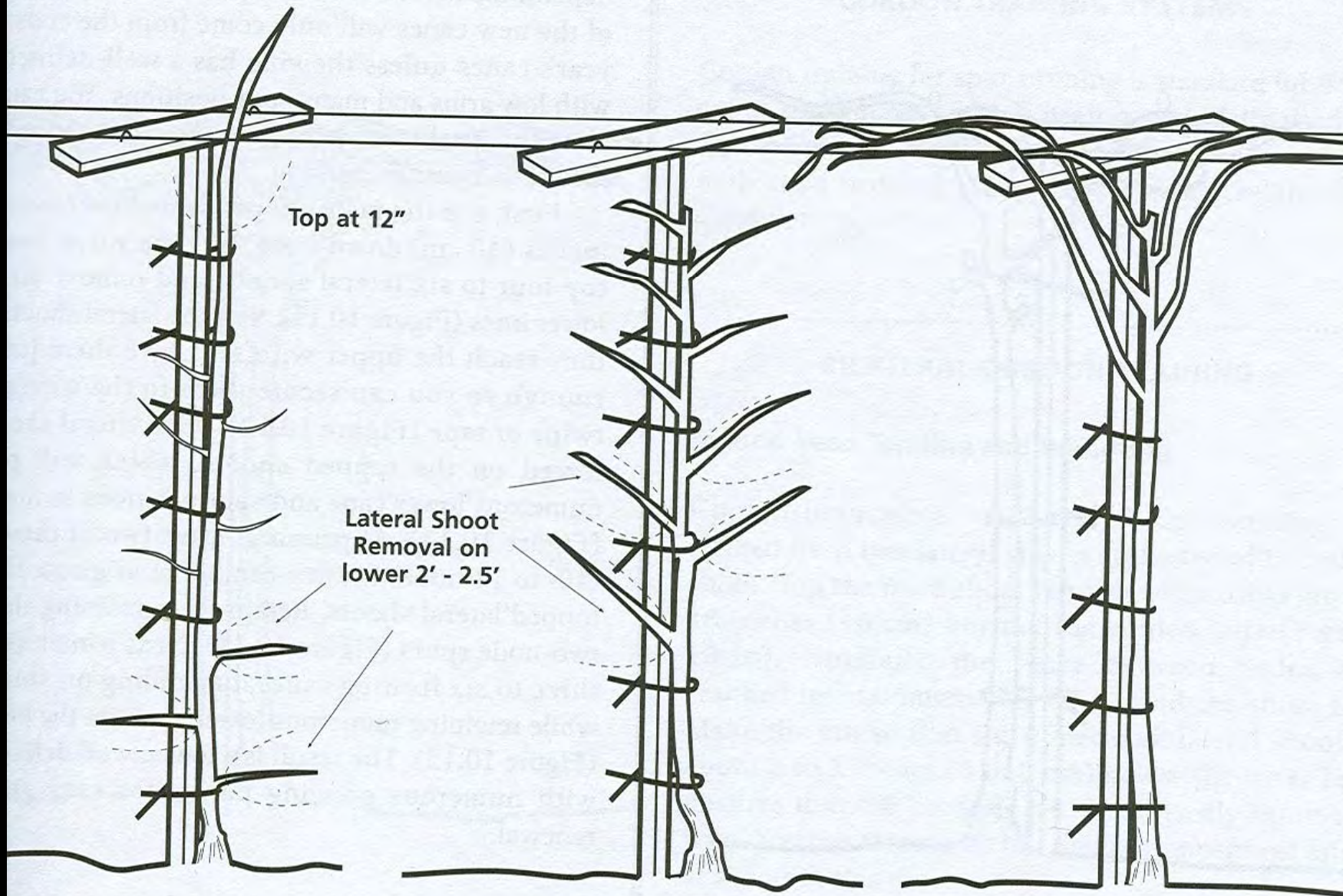


Figure 10.5 Head training: early summer, first year. Top the main shoot and remove lower lateral shoots.

Figure 10.6 Head training: midsummer, second year. Remove lower internal shoots and retain upper ones.

Figure 10.7 Head training: late summer, second year. Secure the upper lateral shoots.

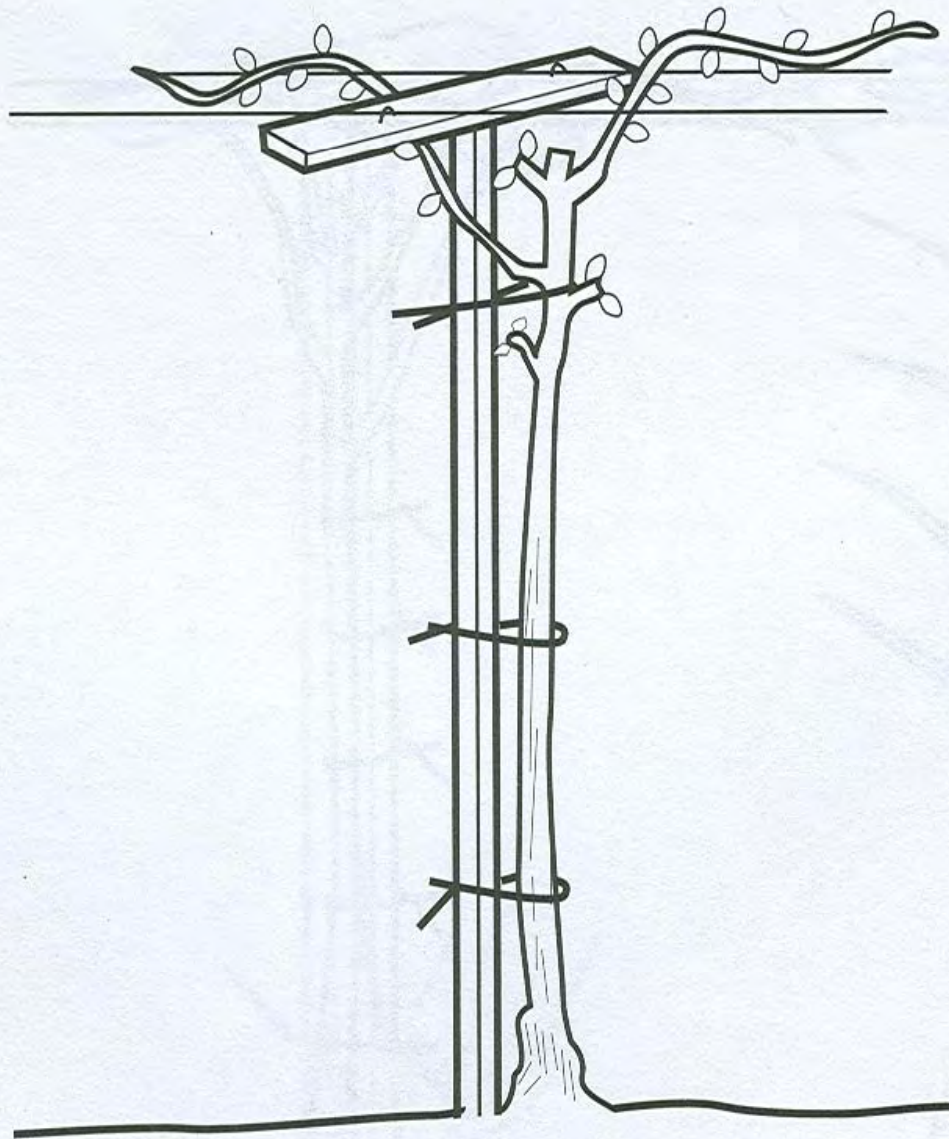


Figure 10.8 Head training: winter between second and third years, after pruning

Management of New Vineyards - Head Pruned with Canes

- 3rd year
 - ◆ Prune to 4 or 5 well placed canes with 13 to 15 nodes



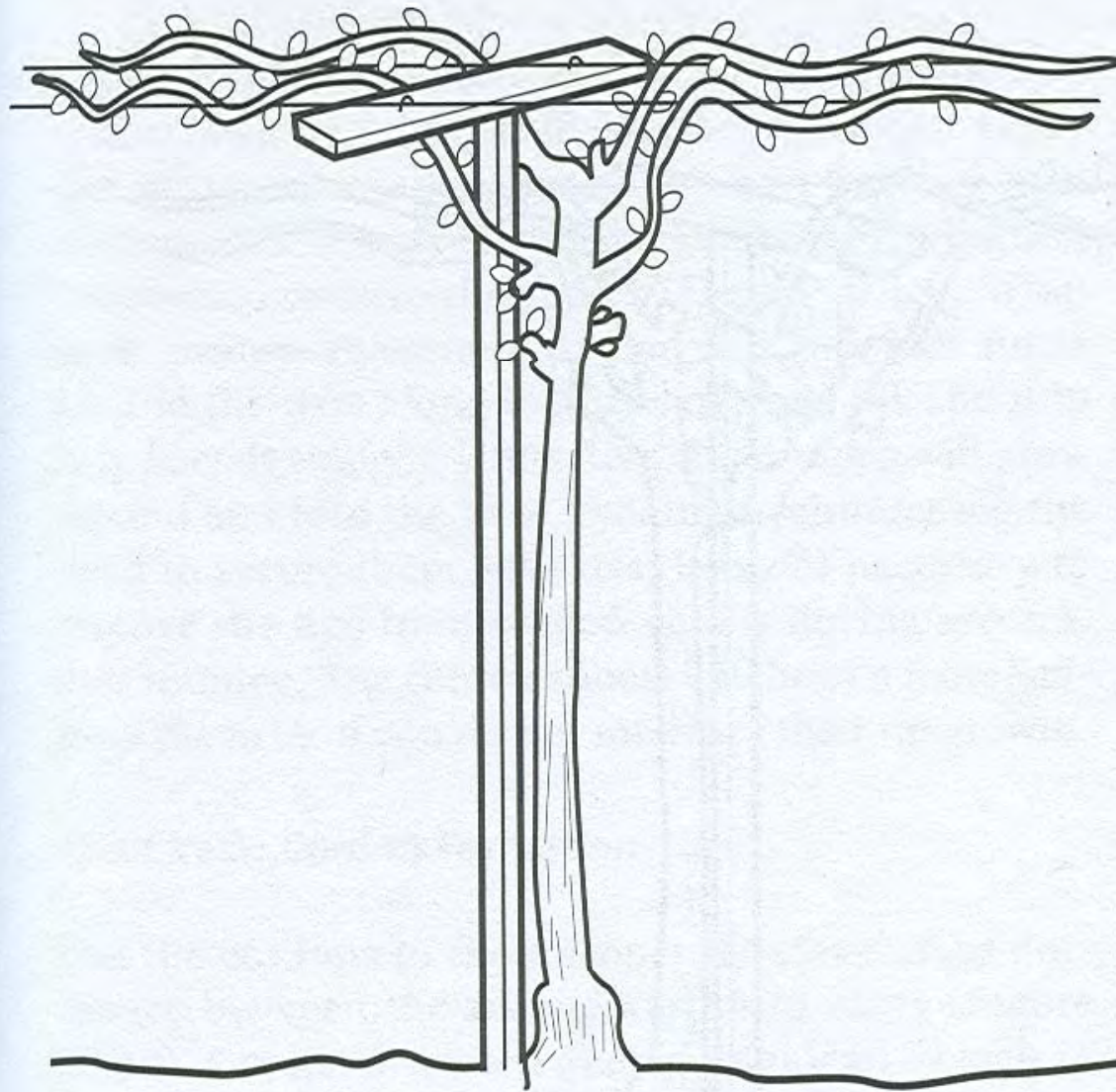


Figure 10.10 Head training: winter between third and fourth years, after pruning

Management of New Vineyards - Bilateral Cordon

- Later in the 2nd year
 - ◆ Remove lateral shoots
 - ◆ Top main shoot
 - ◆ Train and tie down two lateral shoots on wire
 - ◆ Leave one or two spare shoots



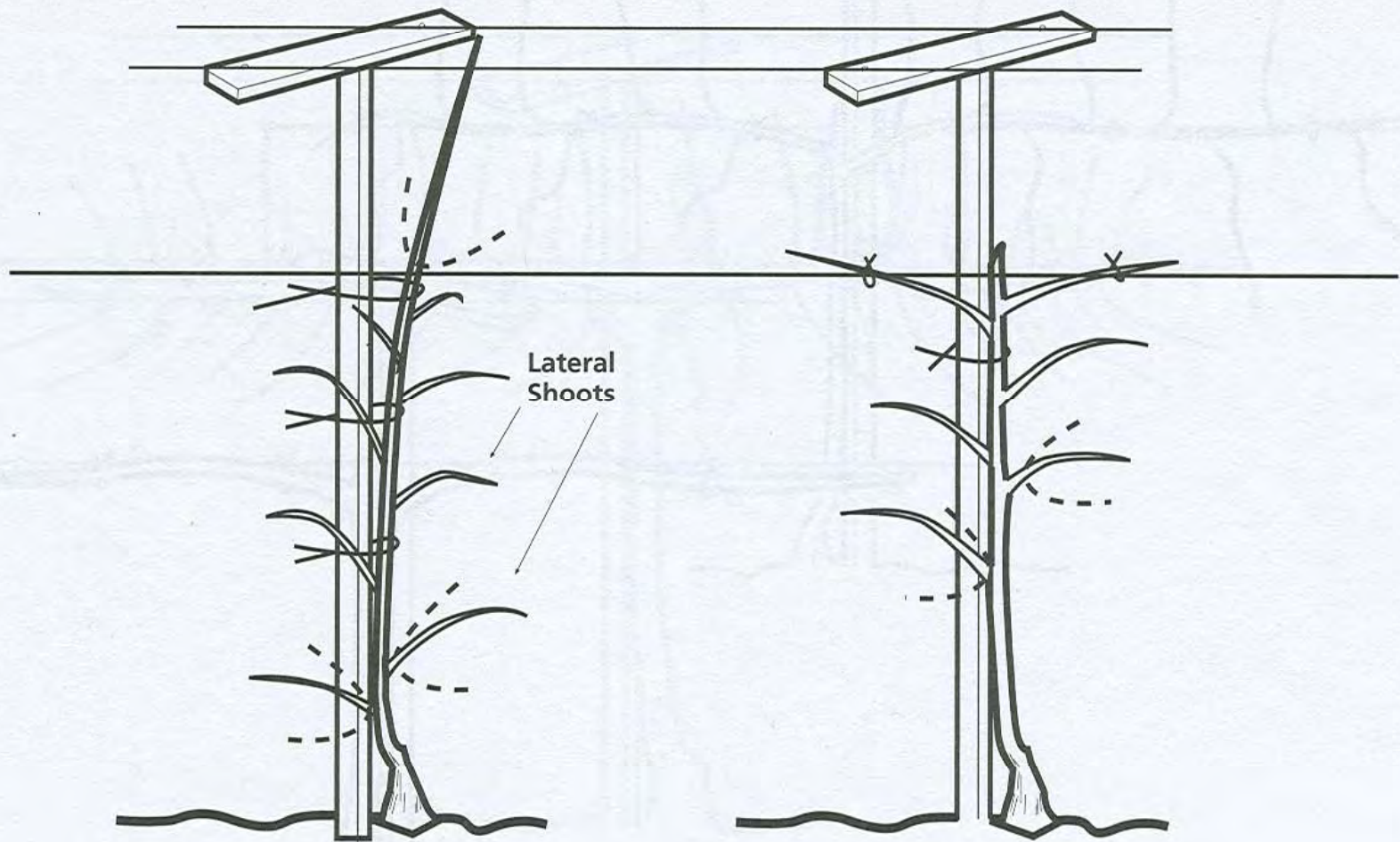


Figure 10.16 Bilateral cordon training: second year, early summer. Top the main shoot and remove the lower lateral shoots.

Figure 10.17 Bilateral cordon training: second year, early summer. Select and tie down the top two lateral shoots; leave one or two spare shoots.

Management of New Vineyards - Bilateral Cordon

- ◆ 3rd and subsequent years
- ◆ Do not over crop
 - ★ Let cordons grow to full length and gain size (diameter)
- ◆ Leave the cordon arms shoot free for the first 20cm and retain spurs at 10-13cm intervals
- ◆ Leave 1-3 buds per spur

