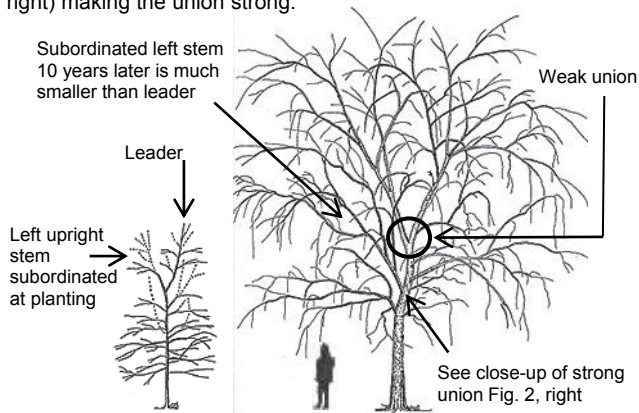
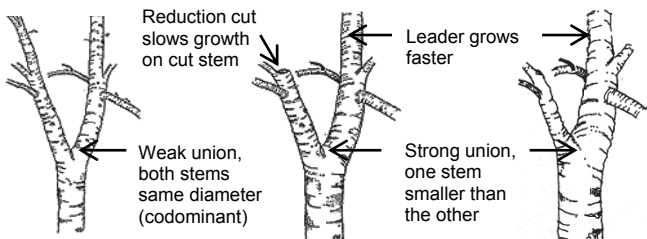


# Pruning at Planting

Start **structural pruning** at planting to correct poor structure by shortening upright stems that compete with the leader. This directs future growth into the leader because pruned stems grow slower (Fig. 1). As a result the aspect ratio (branch diameter compared to trunk diameter) is smaller 4 years after pruning (Fig. 2, center) and much smaller 10 years after pruning (Fig. 2, right) making the union strong.



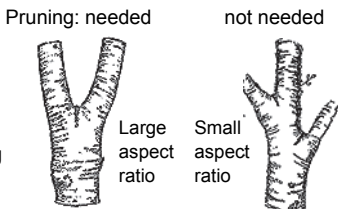
**Figure 1.** Prune at planting to reduce all but one upright stem (left). Subordination over 10 years leads to strong unions, and trees that are easy to maintain. One of two stems on the larger tree (right) needs subordination now to correct the weak union half way up the tree.



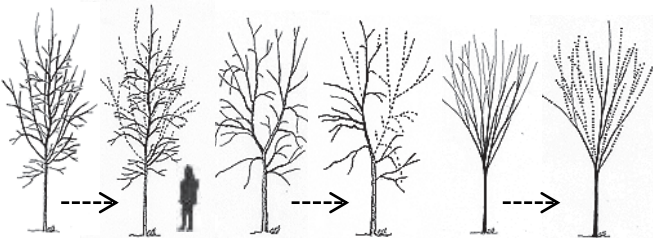
**Figure 2.** Before pruning      4 years later      10 years later

Structural pruning starting at planting and repeated as needed leads to strong unions when employed over a 10 year period. Even young (pencil size) stems with the same diameter (or nearly so) as the leader that occur in the top half of the crown should be subordinated or removed. Branches lower in the crown with a large aspect ratio should also be subordinated or removed (Fig. 3).

**Figure 3.** Prune more from branches that have a large aspect ratio. Some large branches may need as much as 30-60% of their foliage removed. Branches with a small aspect ratio may need little or no pruning because they are not competing with the leader.

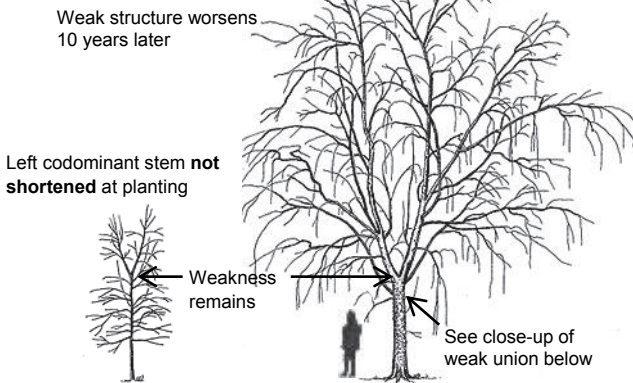


Use reduction cuts where possible on nursery trees to subordinate branches competing with the leader (Fig. 4). Some upright stems and crowded branches can be removed entirely. This directs growth into the leader. Heading cuts may have to be used on small-diameter branches to subordinate growth.

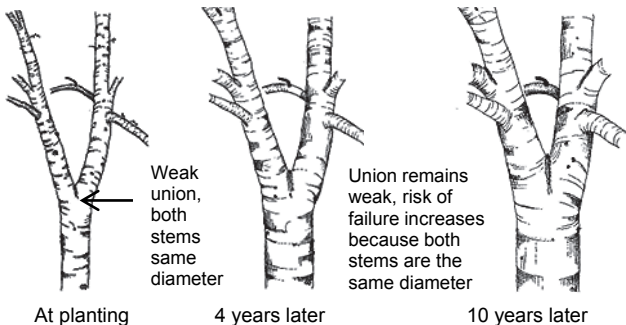


**Figure 4.** Reduce or remove upright stems (dotted lines) at planting.

**Without pruning**, codominant stems at the top of recently-planted trees continue to grow. The result is a weak structure on a sizable tree 10 years later (Fig. 5). The aspect ratio remains the same over 10 years (Fig. 6).



**Figure 5.** Without pruning at planting, both codominant stems grow, resulting in weak structure 10 years later. Contrast with Fig. 1.



**Figure 6.** Unions with stems of equal diameter (large aspect ratio) are weaker than unions with small branches growing from a larger trunk (small aspect ratio). Contrast with Fig. 2.

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