

Wild service tree in Vendsyssel (the northernmost part of Denmark): Five years' survival, growth and health following afforestation on glacial till (Skoven, vol. 45, pp. 138-141).

Our investigation comprised a plot of 0.58 ha in a stand established by afforestation of farmland during spring 2007. The stand includes 16 different tree species (listed below), ten of which were planted at establishment, while the remaining six species were introduced as replacement planting or invaded spontaneously. Based on their frequency in this stand and their potential economic importance, we consider sycamore, cherry, walnut and *Sorbus torminalis* as the main species. The plot included a total of 116 *Sorbus torminalis* trees. The soil developed on sandy glacial till (type luvisol, or similar) with a fragipan at a depth of 40 cm (Figure 1).

During the first five years after planting the height growth of *Sorbus torminalis* was almost the same as for ash and Norway spruce (Figure 3). Sycamore and cherry grew faster and ranged at the same level as Sitka spruce. For walnut the variation in height growth was substantial, but the best walnut trees grew almost as fast as ash. In 2010 and 2011 the average annual height growth of the 50 tallest trees ranged at 111-156 cm for sycamore, 90-126 cm for cherry, 71-113 cm for wild service tree, 87-96 cm for ash, 86 cm for walnut and 48-89 cm for Port Orford cedar / Lawson cypress (Table 2). So far, we have been unable to detect any statistically significant influence of topography or depth to the fragipan on height growth.

The mortality of *Sorbus torminalis* was low (9 percent). The most significant problem for *Sorbus torminalis* was browsing by hare during a period of high snow cover in the winter of 2010 (Table 1 and Figure 2). This effectively reduced the height of the affected trees to 35-40 cm (Figure 3). No other tree species were browsed (the area was fenced).

In 2012 we pre-selected 100 evenly distributed potential future crop trees per ha and 100 reserve trees. Out of these, only 9 trees were *Sorbus torminalis*, 23 were walnut, 31 were sycamore and 53 were cherry. During the selection, sycamore and cherry were avoided in favour of *Sorbus torminalis* and walnut.

In the discussion we emphasize the challenge of managing a mixture of 16 different tree species. We point out the urgent need for timely regulation of the light conditions to favour *Sorbus torminalis* as well as walnut (Figure 4) and the need for early formative pruning as well as subsequent, regular high pruning to avoid inferior timber quality for the main species (Figure 5). We also point out that many of the 'additional' species should be regarded only as serving for the benefit of the hardwood timber species (sycamore, cherry, walnut, *Sorbus torminalis*). Finally, we conclude that the stand includes a suitable share of high-quality stems of sycamore and cherry, if *Sorbus torminalis* or walnut should fail completely.

List of tree species (main hardwood species in bold, based on frequency and potential economic importance)

Acer pseudoplatanus

Alnus viridis

Betula sp.

Chamaecyparis lawsoniana

Fagus sylvatica

Fraxinus excelsior

Fraxinus americana

Juglans regia

Larix sp.

Platanus acerifolia

Prunus avium

Picea abies

Picea sitchensis

Tilia cordata

Sorbus torminalis

Sorbus aucuparia