

Axial variation of the appearance of compression wood

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Variability of wood parameters in a tree is sometimes a rather nebulous concept since variability is evident within single cells, from early- to latewood, from pith to bark and from stem base to the top of a tree. So far, complete stem analyses have been done with a restricted number of parameters, mostly ring-width, with a few samples taken at several heights, but rarely from every terminal shoot. In this study the appearance of compression wood (cw) and the type of early/latewood transition were analysed at a single spruce-tree.

One 81-year old, dominant spruce tree with a straight, flawless trunk and a regular-shaped crown was selected. The tree was felled and disks taken from each terminal shoot. One radius per disk, orientated to south-east, was used for the investigations. The type of transition from earlywood to latewood was assessed visually by using the categories “gradual”, “abrupt” and in addition “compression wood” was identified by the shape, i.e. roundness of the tracheids and the entire ring structure.

As expected, transition from early- to latewood in a spruce appeared to be mainly gradual. However, some years clearly showed abrupt transitions seen throughout the stem. This may be indicative for a strong linkage with climate of the years where these rings were formed. Compression wood was found in the innermost corewood rings along the stem, distinct from the also present juvenile wood. The 1990 tree-ring was found to be thoroughly compression wood in all annual terminal shoots, which could be matched with a severe clear-cutting activity during the previous winter. Between 1935 and 1949 four years showed a clear compression wood formation in the lower part of the stem. This phenomenon may be attributed to a period of mechanical adaptation of the tree.

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Introduction

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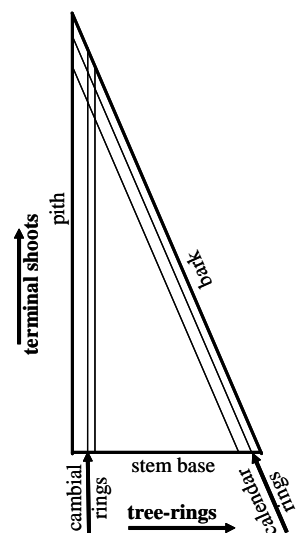
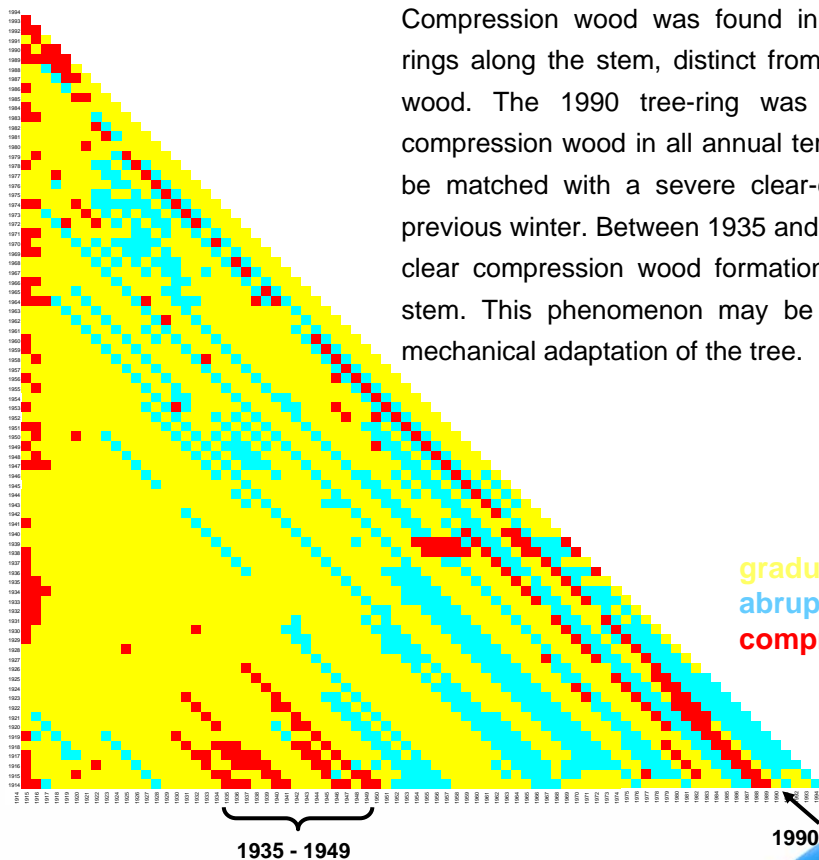
Material and methods

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Results

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Compression wood was found in the innermost corewood rings along the stem, distinct from the also present juvenile wood. The 1990 tree-ring was found to be thoroughly compression wood in all annual terminal shoots, which could be matched with a severe clear-cutting activity during the previous winter. Between 1935 and 1949 four years showed a clear compression wood formation in the lower part of the stem. This phenomenon may be attributed to a period of mechanical adaptation of the tree.



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