

Dendrochronology and Mensuration: Tree Ring Analysis

Increment boring for the purposes core extraction and age determination is a minimally invasive, high yield procedure readily used in silvaculture.

A sentinel is selected based on its geographic location (proximity to site or overall distribution) and size (as related to age). Tree circumference is measured at breast height and divided by π to obtain diameter (DBH). This is measured and recorded to the nearest cm. A hollow shaft increment borer (Suunto, Mattson, Haglof) is screwed into the tree trunk perpendicular to the outer bark and directly toward the center heartwood. This orientation allows for penetrating to the earliest rings preserved in the heartwood. Once the bore has reached depth into the tree, the core extractor is gently inserted to depth and the now freed core removed. The core is placed into a labeled plastic straw and securely stored to prevent any damage. Several length-wise short slits on the straw allow the core to dry thus preventing mold from forming on the core. Cores in straws may be stored under refrigeration to further prevent mold and aid in drying.

The dried, extracted core 'beam' is mounted (glued) into a grooved mount block such that the main tree stem axis (tracheids) are perpendicular to the block thus allowing all annuli to be exposed and read. The gradient formed between the early growing season thin-walled wood and the later thicker walled late wood form the annuli. The beginning of the early wood and the end of the late wood form one annual ring. Sanding the core with fine grit sandpaper (#200) and gently wiping away any dust with a damp cloth allows the annuli to visually stand out. Using stereo dissecting scope (e.g. Leica, Nikon), we mark the mount block with a pencil 'tick mark' at each annuli of the core. In some cases the individual performing the boring may actually reach tree center ('dead on') and this can be seen by the actual 'closed' annual ring indicating the youngest years growth of the tree. The count then begins from core center proceeding outward to the latest annuli. A simple tally of tick marks gives an annuli count and tree age. Cores mounted on blocks can then be safely stored for further review as needed.

Schweingruber, F.H. 1996. Tree Rings and Environment. Dendrochronology. Federal Institute for Snow and Landscape Research. Haupt, Vienna. 609pp.

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