**IAWA Bulletin New Series - Volume 7(4)**

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| **Author(s):** |  |
| **Title:** | **Preliminary material** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 267-268 |
| **Keywords:** |  |
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| **Author(s):** | Josef Bauch |
| **Title:** | **Characteristics and Response of Wood in Declining Trees from Forests Affected by Pollution** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 269-276 |
| **Keywords:** | Air pollution; wood formation; tree decline; wood characteristics; storage |
| **Abstract:** | A review is given of the literature concerned with the characteristics of wood from diseased forests affected by pollution, and the wood properties of these trees with regard to utilisation are evaluated. Quantitative and qualitative studies on the anatomical and chemical characteristics of the wood from diseased trees indica te that changes, which impair the quality of wood, do not occur in softwoods. The physical and elastomechanical properties of wood from diseased trees correspond with those of wood from healthy trees. Preliminary findings with beech show equally reassuring results. Experiments with wood in forest storage do not indicate apredisposition for quality loss. Further research is recommended to understand the structural and physiological relationship in the response of the cam bial tissue in diseased trees. Experiments are also needed on adequate storage procedures once regional foresters have to cope with the harvest of unexpected quantities of diseased trees. |
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| **Author(s):** | F. H. Schweingruber |
| **Title:** | **Abrupt Growth Changes In Conifers** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 277-283 |
| **Keywords:** | pollution; ecology; Annual rings; Switzerland |
| **Abstract:** | Abrupt changes in growth (reduction or recovery) persisting for a number of years and evident in annual ring sequences from conifers are visually identified, dated, and related to crown condition, site, region, and ecological factors. Analysis of several thousand trees shows that radial growth is only very loosely related to the density of needles in the crown. In those regions of Switzerland studied, the different species react differently to environmental conditions, each having its own indicator value. The frequency of growth reductions is governed by climatic conditions and other, unidentifiable factors. Only in a few areas is pollution the probable cause. |
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| **Author(s):** | Brigitte Wahlmann; Eckhard Braun; Siegfried Lewark |
| **Title:** | **Radial Increment in Different Tree Heights in Beech Stands Affected by Air Pollution** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 285-288 |
| **Keywords:** | air pollution; increment profiles; ring width; Fagus sylvatica |
| **Abstract:** | Ring width eurves have been eonstructed from a sample of 12 trees from each of five beech stands in the municipal forest of Wiesbaden. Ring width measurements in six different tree heights from four trees per stand are presented as profiles of inerement. |
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| **Author(s):** | Hans Visser |
| **Title:** | **Analysis of Tree Ring Data Using the Kalman Filter Technique** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 289-297 |
| **Keywords:** | Kalman filter; tree rings; Air pollution; dendro-ecology |
| **Abstract:** | A statistical mcthod is presented to filter the influence of weather variations out of a tree ring chronology. The Kaiman filter technique is introduced to estimate a multiple regression model with stochastically fluctuating weather parameters. It cnables the detection of any change in response of trees to weather. The method is in two ways an improvement upon the frequentIy used method of response functions: I) it is not necessary to assume constant model parameters, and 2) the estimation process is not based on the fitting but on the forecast performance of the model. |
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| **Author(s):** | Richard Jagels |
| **Title:** | **Acid Fog, Ozone and Low Elevation Spruce Decline** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 299-307 |
| **Keywords:** | ozone; Forest decline; red spruce; acid fog; tree ring analysis |
| **Abstract:** | A recently discovered decline of red spruce (Picea ntbens Sarg.) is described for coastal Maine, U.S.A. The symptoms include chlorosis of adaxial needle surfaces, progressive loss of needles (from oldest to youngest) and development of latent vegetative shoots on dorsal surfaces of declining branches. Symptoms are most prominent in trees growing in thin organic soils on granite bedrock where ozone levels are highest and fog pH values are lowest. On sites where fog is less acidic spruce decline has not been observed. Stern cores from 30 trees (two cores per tree) were analysed from each of three sites: Head Harbor, Eastern Head and Roque Island. Head Harbor has trees showing severe decline symptoms and receives ozone levels as high as 0.14 ppm and fog acidities as low as pH 2.9. The soil is thin over granite outcropping. At Eastern Head (less than 1 kilometer away) fog pH and ozone levels are the same, but soils are deeper and exposure is different. Decline symptoms are barely noticeable. At Roque Island the soils are similar to those at Head Harbor but ozone levels are somewhat lower and minimum fog pH values are above 3.3. Two different tree ring measures suggest that Eastern Head and Roque Island have similar site indices for red spruce growth while Head Harbor is poorer. Tree ring analysis revealed that the years 1955-75 were ideal for growth on these sites but many Head Harbor trees began declining in radial increment near the beginning of this period. During the past 15 years average radial increment at Head Harbor was 0.86 mm/year while at Roque Island it was 2.48 mm/year. Although very little visible decline can be seen at Eastern Head, average radial increment for the past 15 years at this site has been only 1.61 mm/year. |
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| **Author(s):** | Ingrid de Kort |
| **Title:** | **Wood Structure and Growth Ring Width of Vital and Non-Vital Douglas Fir (Pseudotsuga Menziesii) from a Single Stand in the Netherlands** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 309-318 |
| **Keywords:** | air pollution; tracheid length; Radial increment; latewood; earlywood; density |
| **Abstract:** | A comparison was made of diameter growth and wood structure in 26 trees of Douglas fir of different vitality cJasses in a decJining, c. 50- years old stand in De Peel (southeastern Netherlands). Ring width patterns agree cJosely but not perfectly with vitality cJasses as estimated by external appearance of the crown. The 'diseased' vitality cJasses all show growth reductions over the last 20 to 30 years. In the most diseased cJass no wood had been formed at all at the stern base over the last 4 to 10 years. The onset of growth reduction may be connected with the effect of air pollution in the last 40 to 50 years. The most striking result was the inverse relationship between growth rate in the first 10 to 15 years of growth, and growth rate in the last decades: all trees which are healthy at present showed slow radial growth when young, and all diseased to dead trees exhibited fast growth in their youth. |
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| **Author(s):** | Dietger Grosser |
| **Title:** | **On the Occurrence of Trabeculae With Special Consideration of Diseased Trees** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 319-341 |
| **Keywords:** | trabeculae; compression wood; diseased trees; wound tissue; Softwoods; hazel growth |
| **Abstract:** | Comprehensive investigations on trabeculae in softwoods have shown that they occur much more frequently than has hitherto generally been assumed. A systematic study oflarge series of microtome sections, i.e., transverse sections and particularly radial sections of extended annual ring sequences will, as a rule, give sufficient evidence for the occurrence of trabeculae and related structures. Apart from this phenomenon an increased occurrence of trabeculae was often found in the annual rings of healthy and diseased trees from forest decline areas from the middle of the 1970's onwards. Moreover, trabeculae occur with particularly great frequency and in significantly larger numbers than in nonnal wood in association with wound tissue fonnation as a consequence of injuries, in spruce with hazel growth, or in cedars with traumatic resin ducts. Also, in compression wood trabeculae are fonned much more often than in normal wood. A detailed survey of trabeculae structure and possible patterns of trabeculae arrangement is also given. |
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| **Author(s):** | N. Torelli; K. Čufar; D. Robič |
| **Title:** | **Some Wood Anatomical, Physiological, and Silvicultural Aspects of Silver Fir Dieback in Slovenia (NW Yugoslavia)** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 343-350 |
| **Keywords:** | site factors; Abies alba Mill.; increment; tracheid length; vitality; wetwood formation |
| **Abstract:** | Silver fir dieback in Slovenia (NW Yugoslavia) was evaluated, and growth suppression and some physiological and anatomical aspects of growth ring formation were studied. The drastic growth suppression after 1950 was reflected in poor basal area increment, and by discontinuous as weil as missing rings. Only in the most diseased trees the height increment was affected. Generally latewood percentage and tracheid dimensions remained unchanged. The physiological mechanism of wetwood formation in sapwood of fir is discussed and compared with red heart formation in beech. On the basis of preliminary experiments, osmotic transport is suggcsted from sapwood to heartwood through the intermediate dry zone. |
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| **Author(s):** | Siegfried Fink |
| **Title:** | **Microscopical Investigations on Wood Formation and Function in Dlseased Trees** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 351-355 |
| **Keywords:** | xylem sap ascent; cambium; Picea abies; Abies alba; annual increment; resin canals; starch; peroxidase |
| **Abstract:** | Histologieal and histochemical investigations were performed on the xylem, cambium, and phloem of Abies alba and Picea abies affected by forest decline ('Waldsterben', 'Neuartige Waldschäden'). In comparison to healthy trees the annual inerement was reduced and correspondingly the active cambial zone was sm aller. No differenees were found in the peroxidase activities in the differentiating tracheids undergoing lignification, and no change in lignin content eould be deteeted UV-photometrieally in the walls of the traeheids of affeeted trees. In general, mueh less starch reserves in the parenchymatous elements of the diseased trees were observed during autumn and spring. Correspondingly, the aetivities of enzymes involved in the mobilisation and transport of these earbohydrates were lower in spring. With the use of fluorescent markers it eould be demonstrated that apparently some areas of the sapwood do not take part any longer in the water conduetion in diseased trees. In most eases differenees between healthy and diseased trees were much more pronounced in fir than in spruce. Furthermore, diseased firs showed a special pathological reaetion with the formation of large mueilage cells in the non-funetional phloem and of oecasional traumatie resin canal barriers in the xylem. |
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| **Author(s):** | Robert A. Gregory; Mansfield W. Williams; Betty L. Wong; Gary J. Hawley |
| **Title:** | **Proposed Scenario for Dieback and Decline of Acer Saccharum in Northeastern U. S. A. and Southeastern Canada** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 357-369 |
| **Keywords:** | Sugar maple; defoliation; starch; wood anatomy; cold tolerance; sugar; radial increment |
| **Abstract:** | A sequence of events is presented that may explain the reported decline of sugar maple trees in the Northeastern United States and Southeastern Canada. The primary factor, caused by defoliation, is a severe reduction in reserve carbohydrates, especially in roots, at the beginning of the leafless period. In this respect, la te defoliators - those that defoliate in late July and early August - are much more destructive than those that defoliate in J une because it appears that carbon is being utilised in July and August by one or more sinks about as fast as it is being assimilated photosynthetically. This, in conjunction with a loss of foliage for an extended period and limited refoliation, could result in severe carbohydrate dcpletion. Limited carbohydrate reserves may not be sufficient for normal respiratory activity during the Ieafless period, or for vernal outgrowth of embryonie shoots. Late defoliation and low carbohydrate reserves also appear to reduce the ability of the trees to acclimate to low winter temperatures; hence, cold winters could result in additional shoot die back and mortality. Other factors such as drought, atmospheric pollutants, and numerous pathogens mayaiso influence carbohydrate reserves, thus contributing to decline. |
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| **Author(s):** | Dietrich Fengel; Horst Schulz |
| **Title:** | **Chemical Studies on Tue Wood of Declining Conifers** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 371-373 |
| **Keywords:** | Pinus sylvestris; Picea abies; pH; carbohydrates; lignin; sapwood |
| **Abstract:** | The soluble components in the wood of conifers (Picea abies, Pinus sylvestris) of different damage c1asses from various sites in Bavaria have been studied. Fresh sapwood wassqueezed and the sap analysed for the amounts of carbohydrates as weil as for the pH value. The investigation of the alkali extracts included the determination of carbohydrates and lignin. Changes in the composition related to tree disease can only be observed in strongly damaged or dead trees. In these cases the pH value and the amounts of the main sugars (fructose, glucose) decrease and the amount of the oligosaccharides increases. In some spruce trees of high damage classes the alkali-soluble lignin also increases. The ex ternal appearance of a tree does not reflect its in temal condition in all cases. |
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| **Author(s):** | W. C. Shortle; J. Bauch |
| **Title:** | **Wood Characteristics of Abies Balsamea in the New England States Compared to Abies Alba from Sites in Europe with Decline Problems** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 375-387 |
| **Keywords:** | cambial growth; sapwood area; extractives; starch; element content; tracheid size; balsam fir; sugars; phenols; moisture content; tree disease; Si1ver fir |
| **Abstract:** | The increasing concern about the health conditions of forests in the United States and Europe 1ed to a comparative study of wood characteristics of Abies balsamea (L.) Mill. in the New England states, and Abies alba Mi1!. in the Federal Republic ofGermany. The advanced visible disease in Abies alba at several sites can be documented by means of many structural and physiological alterations. In diseased trees a suppression of the annual growth increment is obvious, and the individual transverse area of early and latewood cells decreases. The moisture content diminishes in the sapwood significantly and at the same time, wetwood deve10ps and expands into the sapwood. The element content per gram of wood does not significantly differ between healthy and diseased trees of the same stand. The content of soluble sugars increases in diseased trees, while the starch content is drastically reduced. However, parallel to the growth suppression the total amount per year of elements, soluble sugars and starch is significantly less in diseased trees than in healthy ones. In addition, accessory compounds appear to increase with the progress of disease. Cambial electrical resistance is strongly related to damage c1assification, and thereby to cambial growth. |
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| **Author(s):** | A. Frühwald |
| **Title:** | **Technological Properties of Wood from Trees in Polluted Regions** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 389-397 |
| **Keywords:** | wood storage; pollution; Forest disease; wood properties; pine; fir; spruce; beech |
| **Abstract:** | Wood quality from about 230 healthy and diseased fir, spruce, pine and beech trees from various locations in West Germany was tested. In general results are satisfactory for mechanical wood properties, but some physical, chemical and biological indicators lead to the conclusion that logs from heavily diseased trees may be attacked a !ittle earlier and faster by microorganisms during storage. Width of growth rings is reduced in severely damaged softwood trees on most locations whereas beech shows no significant reduction. Declining health of the trees had no or little influence on wood density; the modulus of elasticity and strength were at normal levels and independent of tree damage. Width and moisture content of sapwood were reduced little in pines but more in spruce and fir. A tendency to a more intensely developed irregular brown heartwood in severeIy damaged beech trees could not be proved until now. Storage of spruce in a log yard for four months has shown a slightly faster development of discoloration caused by fungi in diseased trees whereas after seven months wood from healthy trees was more discoloured. After storage strength properties are not or only slightly reduced, but no difference was found between trees assigned to the various health classes. After two years of storage under sprinkling water, pine logs from healthy and diseased trees show no difference in discoloration. |
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| **Author(s):** | J. A. Evertsen; M. P. Mac Siurtain; J. J. Gardiner |
| **Title:** | **The Effect of Industrial Emission on Wood Quality in Norway Spruce (Picea Abies)** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 399-404 |
| **Keywords:** | density; Ring width; latewood percentage |
| **Abstract:** | In this preliminary study, the influence of industrial emission on the wood quality of Norway spruce was evaluated. Intrinsie wood quality determining properties: ring width (RW), mean annual density, percentage annual 1atewood and the product of (RW × (maximumminimum density)) appear to be affected by the emissions of a fertiliser factory adjoining the stands studied. Fluctuations in the performance of these intrinsic wood properties coincide with the start of production by the factory and a change in the manufacturing process. |
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| **Author(s):** | A. Požgaj; S. Kurjatko |
| **Title:** | **Wood Properties of Spruce from Forests Affected by Pollution in Czechoslovakia** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 405-410 |
| **Keywords:** | annual rings; Picea excelsa; fibre saturation point; moisture diffusion coefficient; elasticity; strength; wood density; toughness |
| **Abstract:** | Density, shrinkage, fibre saturation point, annual ring width, compression strength parallel and perpendicular to the grain, ben ding strength, modulus of el ast i city , toughness, and moisture diffusion coefficient are reported for heavily affected spruce trees (Picea excelsa Link) from a forest area in Czechoslovakia exposed to industrial air pollution. Wood density in strongly diseased and dead trees was lower than in healthy trees. This decrease in density is associated with decreasing strength properties. However, at similar low densities the mechanical wood properties of affected and heaIthy spruce do not differ appreciably. |
| **DOI:** | [10.1163/22941932-90001011](http://dx.doi.org/10.1163/22941932-90001011) |

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| **Author(s):** | H. von Aufsess; H. Schulz |
| **Title:** | **Investigations on the Storage Behaviour of Roundwood from Healthy and Diseased Beeches** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 411-415 |
| **Keywords:** | tyloses; Moisture content; cell contents; wood discoloration; fungal attack; microorganisms |
| **Abstract:** | Healthy and variously diseased beeches were felled in March 1985 and were stored, with bark, on supports during the summer months in order to study any effects of disease on storage behaviour. By repeatedly taking disks from stored logs, visible storage defects were registered, moisture content of the wood was determined, and the wood inhabiting microflora was studied by systematic isolation from the wood. Two to three months after felling insignificant brown stained zones appeared in the uppermost sapwood and some minute brown specks were distributed over the entire cross section, which tended to spread over large areas during the storage period. Finally, white rot fungi occasionally destroyed smaller or larger zones between the discoloured brown ones, in initially healthy beeches just as much as in damaged ones. W ood staining microorganisms can only partly be made responsible for these considerable discolorations. Although blue staining fungi had occupied an important position in all logs under study, fungal hyphae were only rareIy found in the dark brown zones even in advanced stages. Here only a profuse formation of tyloses and an increase as weil as oxydative dark staining of the parenchyma cell contents was noticed. |
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| **Author(s):** | Walter C. Shortle |
| **Title:** | **Association Affairs** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 416-417 |
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| **Author(s):** | Editors IAWA Journal |
| **Title:** | **Wood Anatomy News** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 418-420 |
| **Keywords:** |  |
| **Abstract:** |  |
| **DOI:** | [10.1163/22941932-90001014](http://dx.doi.org/10.1163/22941932-90001014) |

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| **Author(s):** | Regis B. Miller |
| **Title:** | **Wood anatomy and identification of trees and shrubs from Israel and adjacent regions. Abraham Fahn, Ella Werk er and Pieter Baas, 221 pp., illust., 1986. The Israel Academy of Sciences and Humanities, Jerusalem. Price: US$ 40.00 (hard cover).** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
| **Pages:** | 421-421 |
| **Keywords:** |  |
| **Abstract:** |  |
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| **Author(s):** | Pieter Baas |
| **Title:** | **Textbook of wood technology I. Structure, identification, defects and uses of the Iranian timbers, with notes on commercial timbers of the world. P. Niloufari, c. 600 pp., illus., partly in English, partly in Persian, 1986. Publications of the University of Tehran 738, Tehran Univ. Press, Iran. Price: US$ 30.00 (paper); available from the author's address: No 16 Laleh Street, Rajai Shahr (Gouhardasht) 31476 Karaj, Iran.** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
| **Publication Year:** | 1986 |
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| **Author(s):** | Editors IAWA Journal |
| **Title:** | **Association Affairs** |
| **Source:** | IAWA Bulletin NS, Volume 7, Issue 4 |
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