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Annotated Bibliography of 
*Chamaecyparis nootkatensis*

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Abstract


Some 680 citations from literature treating *Chamaecyparis nootkatensis* are listed alphabetically by author in this bibliography Most citations are followed by a short summary A subject index is included

Key words Yellow-cedar, Alaska-cedar, Alaska yellow-cedar, bibliography

Foreword

A considerable amount of material has been published on *Chamaecyparis nootkatensis* (D Don) Spach in the 28 years since the 1969 printing of “Alaska-cedar, a bibliography with abstracts” The current bibliography is a revision and expansion of the initial 1969 publication, now out of print The original 301 citations are included here with new ones to form a single bibliography of 680 citations for quick access to literature on yellow-cedar

Citations are listed alphabetically by author and are numbered A subject index references the citation numbers so that users can find literature on a range of topics about this tree species

A brief summary, the majority written by the compilers, follows most of the citations Note that the common name “yellow-cedar” is used throughout these summaries Many common names have been used for this tree, but “yellow-cedar” seems to be the one most frequently used within the natural range and refers to the distinctive heartwood color of the tree The accepted U S common name, “Alaska-cedar” (Little 1953), was not used because it refers to only one end of the natural range of the tree Interestingly, even the scientific name has not been universally accepted Penhallow (1896), Camus (1914), Wolf (1948), and Bartel (1993) question whether there are sufficient differences between species of *Chamaecyparis* and *Cupressus* to warrant Spach’s (1842) construction of the genus *Chamaecyparis* Several authors, most notably Penhallow, would return members of *Chamaecyparis* to *Cupressus* (e g, *Cupressus nootkatensis* D Don) but maintain these taxa in a small subgenus of formally *Chamaecyparis* species

References on yellow-cedar were found by searching eight major databases, botany and forestry sections of libraries, and the World Wide Web Some were found in the reference or literature cited sections from these papers Others were found by merely collecting photocopies and reprints of papers as we came across them over the years

Please send citations or copies of new literature or older literature that we may have overlooked to one of the authors (addresses are on the inside front cover) We intend to maintain a consistently updated version of this bibliography

We thank Lillian Petershoare for assistance with literature searches, Karen Esterholdt for help with formatting citations and a thorough review, and Ellen Anderson for the cover illustration We are also grateful to our yellow-cedar colleagues in British Columbia and Oregon who were encouraging, sent reprints of their research, and gave reviews James Arnott, Steven Grossnickle, George Edwards, John Russell, Joe Antos, John Owens, Ingemar Karlsson, Michael McWilliams, and Don Zobel
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1. **Anon. 1929.** Properties and uses of Alaska cypress. The Timberman. 30(11). 39-40

   Discusses briefly the nomenclature, description, character of stands, working qualities, and uses of yellow-cedar Log and lumber grading rules also are discussed.

2. **Anon. 1959.** Canadian building timbers: British Columbia species Wood 24(8)-322-325

   Yellow-cedar wood is highly regarded in Canada and the United States for interior woodworking and paneling. The wood has a fine texture and is responsive to finishing treatments. Freshly cut wood has a strong but pleasant aromatic scent generally absent in seasoned material. The wood weighs about 29 lb/ft³ in seasoned condition. Shrinkage in drying is slight, and the wood is noted for dimensional stability in service. It is used for both construction and decoration.


   Gives a brief description and illustrations of yellow-cedar's foliage, flowers, and cones.


   Suggests that yellow-cedar would perform well at high elevations as an introduced tree species.


   A new genus and species are described for a fungus isolated from a wound on a yellow-cedar tree growing in Alaska.


Provides some general comments on the ecology of yellow-cedar. Classifies yellow-cedar as a stress tolerator. It allocates relatively more resources to defense and less to growth and reproduction than many other conifers. Yellow-cedar would be a good candidate for studies on climate change because of its longevity and responsiveness to environmental changes.


Provides density values and strength properties for the wood of yellow-cedar.


Yellow-cedar occurs in the park up to 7,000-ft elevation. It is common on northern exposures, along streams, and in basins at the head of canyons. It also grows on crests and ridges where frequent showers and fog supply the moisture it demands. In sheltered localities, it grows to a height of 80 ft, but is commonly small with a bent and twisted stem and somewhat scrubby appearance. A general description is given.


Vegetation is described in the Williamette National Forest near Mount Jefferson, Oregon, and yellow-cedar is found sparingly. A small stand of yellow-cedar is reported at the summit of New Monument. Its occurrence is assumed to represent a relic of a larger range that has not been favored by the modern dry climate.

12. **American Forestry Association. 1955.** These are the champs. American Forests. 61(9): 31-40.

The largest yellow-cedar known is located in Olympic National Park, Washington: circumference at 4-1/2 ft is 21 ft; height 175 ft; spread 27 ft 5 in. Reported by Robert L. Wood, Poulsto, WA.

[Note. An unpublished report in the World Wide Web (Olympic National Park homepage) describes a yellow-cedar tree in the park to have a 452-in circumference (12-ft diameter) diameter, height of 120 ft, and spread of 27 ft.]


Mentions that the largest known yellow-cedar occurs in the state of Washington.


A huge roof structure was built in Los Angeles to completely cover a 15-acre reservoir Yellow cedar Glulam beams were chosen for all support pieces because of their strength and their durability without using wood preservatives The unique domelike roof reduces evaporation and protects 90 percent of the drinking water for the City of Los Angeles


Describes the distribution, habitat, life history, and varieties of yellow-cedar


Leaf-oil of Chamaecyparis nootkatensis is examined by using a technique of small-scale dehydrogenation and gas-liquid chromatography The absence of eualalene confirms the difference between heartwood oil and leaf oil


Reports on the cis and trans structures of calamenes from the leaf oil of yellow-cedar Includes the artificial synthesis of these compounds


The composition of leaf oil extracted from yellow cedar is reported The sesquiterpenes valencene and nootkatene from the heartwood of yellow-cedar are not found in leaf oil


Reports on the stereochemistry of the sesquiterpene leaf fraction and discusses the biogenetic importance of these stereo assignments


Determines the structure of several constituents of leaf oil from yellow-cedar

Indicates that yellow-cedar is common around Sitka and many other parts of southeast Alaska, where it occurs from sea level to about 2,000 ft elevation.


Provides a brief description of yellow-cedar. The 1973 reprint contains illustrations of foliage and cones.


Describes the growth and form of yellow-cedar and other vegetation in the vicinity of Sitka. Includes a plate and a caption illustrating a dying yellow-cedar.


A brief description of the tree's appearance, uses, and range in Alaska and British Columbia. The odor of the wood is described as "strong and pleasant."


27. **Andrews, Clarence L. 1934.** Russian shipbuilding in the American colonies. Washington Historical Quarterly 25:3-10

Describes the use of yellow-cedar for shipbuilding in Alaska by the early Russian colonists, including the construction of the famous Politofsky, a steamer ultimately purchased by the United States after the transfer of the Alaska Territory. Sitka was a center of shipbuilding during the end of the period of Russian control of Alaska. Russian writers state with pardonable pride that there was no establishment for shipbuilding in San Francisco fit for handling vessels, that there was only one on the whole stretch of Northwest Coast, the one at Sitka, and that to it all ships requiring repair must come."


Provides detailed information on the ecology of yellow-cedar in the southern portion of its range, including growth form, reproduction, and occurrence related to physical parameters and associated flora. Compares these characteristics with growth in the northern portion of its range. Illustrates study sites in Washington, Oregon, and California, which may be the best distribution map for yellow-cedar in this part of its range. Describes reproduction from seed and from layering. Provides a correlation of height-age for yellow-cedar trees. Indicates that the current populations may be relicts of those more widespread in moister times.
trees of other species may limit its distribution today. The most consistent characteristic of yellow-cedar's occurrence is its proximity to moderate- and high-elevation sites that lack a closed forest canopy, rock outcrops, avalanche tracks, and the margins of meadows, lakes, and streams.


Yellow-cedar seasons readily, and 1- and 1-1/2-in stock may be dried successfully by the same schedule as that for western redcedar. Two-inch stock, particularly wide clear wood, requires more careful treatment, and a schedule is given.


Yellow-cedar is the highest reaching tree species, ascending beyond 7,000 ft and growing out of rock cliffs in the Olympic National Park rain shadow. Krummholz of this species have advantages over others in severe alpine environments because of extremely durable wood and more flexible branchlets that are less apt to be scoured off. Roots of Krummholz yellow-cedar may extend 100 ft. Root sprouting and layering probably explain scrubline development of yellow-cedar shrubs whose foliage may form circles nearly 50 ft in diameter. Its wood is very durable; trees killed nearly 50 yr in the past were used to build much of the interior of a well-known administration building. The condition of yellow-cedar at timberline throughout its range is discussed.


Gives a line drawing of yellow-cedar, a description of the tree, and information on the range and habitat requirements. Describes Krummholz growth of yellow-cedar. Mentions the construction of buildings from the wood of yellow-cedars dead nearly 50 years.


Studies the influence of short and long photoperiods and three levels of moisture stress on shoot morphology and physiology of yellow-cedar rooted cuttings. Moisture stress reduced growth, but short photoperiod did not. Short days or moisture stress had little effect on cold hardiness. Gas exchange rates were reduced significantly by low root temperature. Shoot growth can be controlled in the nursery by using 9-hr photoperiods and specific predawn shoot water potentials.

Reports on the survival and growth of yellow-cedar and other tree species 13 years after planting in British Columbia. Yellow-cedar had the best survival and second best height growth of species planted in montane environments. Yellow-cedar suffered the greatest form problems, which were attributed primarily to snow breakage and, to a lesser degree, browsing.


Several treatments were given to rooted cuttings of yellow-cedar to induce dormancy and prepare stock for transplanting. Short daylength and water stress reduced shoot growth, but responses were transitory. Short daylength increased cold hardiness but water stress did not. Implications for short- and long-term treatment effects on survival and growth are given.


An assessment was made of artificial and natural regeneration with several endemic tree species at 12 different locations at middle and high elevations (e.g., 500-1000 m) in southwestern British Columbia. Survival for planted yellow-cedar seedlings was high (over 90 percent after 13 yr), but this species had the highest frequency (55 percent) of stem and form defects. Most damage was attributed to breakage from snow. The authors speculated that this problem would subside as seedlings grew larger. The most common causes of seedling mortality for yellow-cedar seedlings were drought and winter desiccation (for the first 3 yr) and competing vegetation (for yr 4 to 13).


The foliar rust fungus is formally described from a specimen collected from a yellow-cedar tree growing on Mount Jefferson, Oregon. The fungus was first collected by Trelease while on the Harriman expedition near Sitka, Alaska. This fungus is unique for the genus in having a uredial stage.


Discusses the foliar rust of yellow-cedar, Gymnosporangium nootkatense.


Contrasts the two major forest declines of western North America, including that of yellow-cedar, and several minor declines with 20 characteristics and symptoms of forest decline. Presents an hypothesis that yellow-cedar decline and pole blight of western white pine were both initiated by extreme winter weather events that led to cavitation in the xylem of affected trees.

42. Aulin-Erdtman, Gunhild. 1950. Studies of the tropolone series I Thujaplicins and nootkatin Acta Chemica Scandinavica 4 1031-1041

Ultraviolet absorption spectra and molecular weight determinations are given for a new natural compound, nootkatin, which was isolated from the heartwood of Chamaecypans nootkatensis. Nootkatin is shown to be a tropolone derivative.


Contains a brief description of yellow-cedar. The species has only limited suitability for landscaping in southeast and extreme southern Alaska.

44. Baerg, Harry J. 1955. How to know the western trees, pictured keys to the native and cultivated trees found growing in the Rocky Mountains and westward, with suggestions and aids for their study Dubuque W C Brown Co 170 p


46. Bailey, L. H. 1933. The cultivated conifers in North America, comprising the pine family and the taxals (successor to the cultivated evergreens) New York Macmillan 404 p (2d printing, 1948)

Contains a brief description of yellow-cedar and describes four varieties: var compacta, var glauca, var lutea, and var pendula.

47. Bailey, Virginia L; Bailey, Harold E. 1949. Woody plants of the western national parks, containing keys for the identification of trees and shrubs American Midland Naturalist, Monogr 4 Notre Dame, IN University Press 274 p

Contains a key that includes yellow-cedar.


Reports on a study of the branching habits of yellow-cedar. Spacing between leaf axils increased from the base to the apex of branches.
49. **Baillaud, Lucien; Courtot, Yvette. 1955.** Correlations et polarités dans la morphologie d'un cypres Correlations and polarities in the morphology of a cypress Annales Scientifiques de l'Universite de Besancon 6 83-93

A study on the morphology of yellow-cedar

50. **Baker, Frederick S. 1949.** A revised tolerance table Journal of Forestry 47 179-181

Yellow-cedar is classed as "tolerant" on a scale including very tolerant, tolerant, intermediate, intolerant, and very intolerant. It is also marked as a species for which there are few data, and Baker cautions that this classification is highly uncertain.


Yellow-cedar and mountain hemlock are characteristic trees in the Hudsonian zone, ranging from about 5,000- to 6,000-ft elevation.

52. **Balfour, F.R.A. 1932.** The history of conifers in Scotland and their discovery by Scotsmen In Conifers in cultivation Conifer Conference, Royal Horticultural Society Report 1931 177-211

*Cupressus nootkatensis* was discovered by Menzies and named by Lambert after the sound on the west of Vancouver Island where Captain Colnett's ship, Prince of Wales, anchored in July 1787. The tree was brought into cultivation in 1853. No cypress is of more symmetrical habit or hardier constitution.


Yellow-cedar is the most valuable timber found on some of the islands in the Alexander Archipelago and in the neighborhood of Sitka and frequently attains a height of 100 ft and diameters of 5 or 6 ft. The wood is in demand by shipbuilders and cabinetmakers because of its fine texture, durable quality, and aromatic odor.

54. **Bandegee, T.S. 1910.** Partial list of plants, chiefly shrubs and trees In Heller, Edmund, ed Mammals of the 1908 Alexander Alaska expedition, with descriptions of the localities visited and notes on the flora of the Prince William sound region Berkeley, CA University Press University of California Publications in Zoology 5(11) 349-360

Notes that yellow-cedar is found on the northeast point of Hinchinbrook Island in Prince William Sound. It grows close to the shore at low elevation. It was not seen elsewhere, but is known from Hawkins and Glacier Islands. The distribution of yellow-cedar in this area is thought to be very sporadic. Other vegetation encountered is described.

Reports on the morphology and growth of open-pollinated progeny from two sites (swamp and upland) in British Columbia. Results indicate that inbreeding occurs in some portions of tree crowns where they are isolated horizontally or vertically from neighboring yellow-cedars. Recommends seed collections from codominant trees rather than dominant trees, because the former are more likely to be outcrossing.


Abnormal rays, such as reported previously for *Thuja, Juniperus,* and *Libocedrus,* occur also in *Chamaecyparis.* They are larger than ordinary rays and differ in the arrangement and structure of the cells. The abnormal rays are described in detail. Three species of *Chamaecyparis* were studied: *C. lawsoniana,* *C. thyoides,* and *C. nootkatensis.*

58. **Bannan, M.W. 1950.** The frequency of anticlinal divisions in fusiform cambial cells of *Chamaecyparis* American Journal of Botany 37 511-519

Frequency of anticlinal divisions in fusiform cambial cells of *Chamaecyparis lawsoniana, C. thyoides,* and *C. nootkatensis* was studied. Nearly all anticlinal divisions were of the pseudotransverse type and occurred as often as three or four times a year when growth was vigorous.

59. **Bannan, M.W. 1951.** The annual cycle of size changes in the fusiform cambial cells of *Chamaecyparis* and *Thuja* Canadian Journal of Botany 29 421-437

In stems exceeding a few inches in diameter, most of the pseudotransverse divisions involved in the multiplication of fusiform cambial cells occur toward the end of the growing season. Often these aestival transverse divisions are immediately followed by extensive elongation of the newly formed cambial cells, especially at their overlapping tips. In the succeeding year, relatively slight elongation ensues during the development of the first quarter of the annual ring, but through the succeeding quarters the amount of extension increases and is usually maximal in the final quarter. The actual rates of elongation remain undetermined. The multiplication of fusiform initials is accompanied by loss, most of the failure taking place during the last quarter. Generally the fusiform initials with the most extensive ray contacts survive and enlarge, and those with poor ray associations fail or are reduced to potential ray initials. The elongations and multiplication of fusiform initials tend to produce local ray deficiencies. Reduction of the fusiform initials with the poorest ray contacts to ray initials rectifies to a varying extent the ray shortages in those areas (Bannan's summary)
60. **Bannan, M.W. 1951.** The reduction of fusiform cambial cells in *Chamaecyparis* and *Thuja* Canadian Journal of Botany 29 57-67

The loss of fusiform initials from the cambium which is of frequent occurrence in all parts of the tree, takes place in different ways. Some cambial cells seem gradually to fail and are shortly lost from the cambium by maturation into more or less imperfect xylem or phloem elements. The majority are transversely subdivided by one or a succession of anticlinal divisions that begin near the center of the fusiform initial and usually extend to the daughter cells. The resulting segments shorten through the following periclinal divisions, some disappearing during the process of shortening and others undergoing transformation to rays initials. Nearly all new rays in the secondary body originate in this manner.


The trends in variation in different parts of the tree with regard to tracheid and ray cell dimensions, size and distribution of rays, size and arrangement of pits, and thickness of cell walls were compared between three species of American *Chamaecyparis* and other Cupressaceae. Intraspecific variability is usually so extensive that specific ranges overlap widely. No single microscopic character is entirely diagnostic, but certain structural features are valuable when used together. Despite this variability, Penhallow (1896) uses these characteristics to organize these species taxonomically.

62. **Bannan, M.W. 1966.** Spiral grain and anticlinal divisions in the cambium of conifers Canadian Journal of Botany 44 1515-1538

Discusses the orientation of pseudotransverse divisions in the cambium of conifers and presents in tabular form the sequels to 40,000 pseudotransverse divisions, with reference to failure or lineal continuation of sister fusiform initials arising therefrom in 25 conifer species, including yellow-cedar.

63. **Bannan, M.W.; Bayly, Isabel L. 1956.** Cell size and survival in conifer cambium Canadian Journal of Botany 34 769-776

Discusses the process of division and survival of fusiform initials in conifers. Length of fusiform initials at pseudotransverse division, and information on surviving and failing fusiform initials of 15 conifers, including yellow-cedar, are tabulated.

64. **Bannan, M.W.; Whalley, Barbara E. 1950.** The elongation of fusiform cambial cells in *Chamaecyparis* Canadian Journal of Forest Research 28C 341-355

After their origin, sister fusiform initials usually elongate rapidly. Rate and amount of extension differ, often proceeding in a somewhat periodic fashion. Growth appears to be apical, 'intrusive' in the sense that the elongating tips thrust between other cells. No evidence was found to support the theory of simultaneous elongation of considerable portions of adjoining walls by "symplastic" growth.

65. **Banner, A. 1985.** Classification and successional relationships of some bog and forest ecosystems near Prince Rupert, British Columbia. Forestry Abstracts 46(10) 633

The historical abundance of vegetation of the north coast of British Columbia is reconstructed by using pollen analysis, peat stratigraphy, and radiocarbon dating. Pollen grains from western redcedar and yellow-cedar were not distinguished from one another and were grouped as cedars. Cedars were present during the entire sequence (e.g., from 8700 yr BP to present) and began to dominate vegetation from their zone III. A cooler wetter climate about 7000 to 6000 yr BP to the present may have triggered this development. These floristic patterns indicate a successional complex in continual flux, with climate playing an important controlling role. The authors mention Heusser's (1960) comment that cedar pollen does not preserve well, but they suggest that cedar pollen found in their deeper (older) samples appeared as well preserved as those found near the surface.


Reviews the distribution and characteristics of *Cupressus* and *Chamaecyparis*, the occurrence of natural hybrids, and the possibility of breeding for superior qualities.


Yellow-cedar leaf oils and several other plant extracts were tested as possible sources of longifolene and related compounds. The concentrations of these compounds from yellow-cedar leaf oil are given. A pine and a liverwort are more likely sources.

69. **Barbour, Michael G.; Major, Jack. 1977.** Terrestrial vegetation of California. New York: John Wiley and Sons

Mentions the occurrence of yellow-cedar in the subalpine communities around the Siskiyou Mountains in California and gives specific locations (p. 729). A table lists yellow-cedar as a minor forest component on mesic and xeric slopes in both a Shasta [red] fir and a mountain hemlock series. A figure suggests that yellow-cedar has a wide range of moisture tolerance. Yellow-cedar is listed with other conifers having low fire resistance and very low colonizing ability. It apparently persists in open areas because of its ability to reproduce vegetatively.


Summarizes the planting program for yellow-cedar in British Columbia. Presents results on the growth of yellow-cedar plantings. Recommends more work on tree improvement.

Gives a key to the family Cupressaceae, its genera, and species in California. Interestingly, the author chooses to use *Chamaecyparis* as a subgenus of *Cupressus* and to place Port-Orford-cedar and yellow-cedar in this section of *Cupressus*, the latter under the name *Cupressus nootkatensis* D. Don.


Reviews known information and literature on the chemistry of extractives from foliage and heartwood of yellow-cedar by providing a chronological sequence of discovery. Indicates that the extractives from heartwood are solely responsible for the excellent durability of yellow-cedar wood.

73. **Barton, G.M.; MacDonald, B.F. 1971.** Chemical reactions in green wood Ottawa- Canadian Forestry Service, Department of Fisheries and Forestry Bi-Monthly Research Notes. 27(6). 41.

Of western conifers, only western redcedar and yellow-cedar contain both 6- and 7-carbon ring structures in wood.

74. **Bauger, E.; Smitt, A. 1960.** Et treslags-og proveniensforsok på Stad An experiment on tree species and provenances on Stad. Meddelelser fra Vestlandets Forstlige Forsoeksstasjon 11(2) 34- 61-121

Yellow-cedar from Chichagof Island, Alaska, was planted in 1922 as 2-2 planting stock. Seventy percent survived. Most were about 40-50 cm high but a few were 1.5 m when sheltered. They are green and look healthy but have not been able to grow above the surrounding vegetation because of wind. Cones with seed were found on even the small plants. The species is not suitable for planting along the outer coast because of wind.


Yellow-cedar is included in the tree species found in the subalpine salal-Pseudotsuga (*Gaultherieto-Pseudotsugetum Subalpinum*) association characteristic for elevations from 3,000 ft to timberline (7,000-8,000 ft) in Oregon and Washington.

77. Bender, F. 1963. Cedar leaf oils Publ 1008 [Place of publication unknown] Canadian Department of Forestry, Forest Products Research Branch 16 p

Describes methods of producing oil from leaves of *Thuja occidentalis* *T. plicata*, *Juniperus virginiana*, and *Chamaecyparis nootkatensis*, and gives data on yields, production, and prices. Some properties of the oil are tabulated and a brief description is given of the industry in Canada and the United States with details of the main commercial outlets in Canada.

78. Benson, Gilbert Thereon. 1930. The trees and shrubs of western Oregon Contributions to Dudley Herbarium Stanford University, CA Stanford University Press 170 p Vol 2

Briefly reviews nomenclature and distribution of yellow-cedar in Oregon. Yellow-cedar is listed, along with *Pinus albicaulis*, *Abies lasiocarpa*, and *Tsuga mertensiana*, as the most distinctive trees in the Hudsonian zone in the high peaks of the Cascade Range, Siskiyou Mountains, and Coast Range.


80. Berry, James B. 1924. Western forest trees New York Dover Publishers 212 p (Corrected reprint of original publication by World Book Co., 1964)

81. Betts, H.S. 1929. The strength of North American woods Misc Publ 46 Washington, DC U S Department of Agriculture 17 p

Contains tables showing the properties of various woods, actual and comparative, with explanations.


Summarizes the supply, growth, wood properties, and uses of yellow-cedar. Provides a map of the natural range known at the time.

83. Beyse, R. 1990. Nadelholzer aus Nordamerika Conifers from North America Forst- und Holzwirtschaft (Germany) 45 610-612

84. Bilderback, T. 1983. Leyland cypress propagation (x *Cupressocyparis leylandii*, an intergeneric hybrid between *Cupressus macrocarpa* and *Chamaecyparis nootkatensis*) International Plant Propagators' Society 32 410-413

Gives results on rooting cuttings of Leyland cypress. Describes a few ornamental uses. Mentions that the hybrid is sometimes attacked by a bagworm, and in the San Francisco Bay area, it is susceptible to *Phomopsis* canker. Claims that several of the clones of Leyland cypress may be the fastest growing conifers in the world.
85. **Blackerby, Alva W. 1945.** Opportunities for minor wood product industries in Alaska Juneau, AK U S Forest Service, Alaska Region 20 p

86. **Bloome, R.; van Hulle, J. 1967.** Vegetative propagation of trees *Chamaecyparis nootkatensis* No 42 Wetteren, Belgium B V O Madelelingen 5 p

Reported little success in early attempts to root cuttings of ornamental yellow-cedar trees

87. **Bones, J.T. 1963.** Relating outside- to inside-bark diameter at top of first 16-foot log for southeast Alaska timber Tech Note 52 Juneau AK U S Forest Service, Northern Forest Experiment Station 2 p

Shows conversion factors relating diameter outside bark to diameter inside bark for western hemlock, Sitka spruce, yellow-cedar and western redcedar, with information on the number and size of sample trees measured

88. **Bongard, M. 1833.** Observations sur la vegetation de I lie de Sitcha Comments on the flora of Sitka Island Memoires de L'Academie Imperiale des Sciences de St Petersbourg 6(2) 119-177

Yellow-cedar is formally described as a new species under the scientific name *Thuja excelsa* Bong from specimens collected near Sitka A translation of the introduction to this paper suggests that Mertens (1833) may have made the plant specimen collections Probably unknown to Bongard, yellow-cedar was described by David Don 9 years earlier under the name *Cupressus nootkatensis* (see Don 1824) Under the rules of botanical nomenclature, the first valid description takes precedence, but the name *Thuja excelsa* is commonly used early in the 1900s, especially in Europe


Gives a brief description of yellow-cedar and mentions that it can be found in association with birch in Prince William Sound

90. **Bower, R.C.; Ross, S.D.; Dunsworth, B.G. 1989.** Effect of GA3 treatment timing in relation to natural day length on flowering and sex expression in *Chamaecyparis nootkatensis* Canadian Journal of Forest Research 19 1422-1428

Reports on a study of hormone gibberelin GA3 applied to field-grown small trees and potted trees The timing of application had more influence on seed cone formation than did the number of weekly sprays The optimum timing appeared to be linked to a specific stage of ontogeny during development of the bud apex This occurs shortly after resumption of shoot elongation in spring and seems to be triggered by accumulation of heat sum (degree days) rather than photopenod A higher concentration of gibberelin was required to initiate seed cones than pollen cones

Gives a description, distribution, elevational limits within the range, and some general information about yellow-cedar. Both editions give the same information on yellow-cedar.


Principles and methods are given for designing regeneration surveys. The use of aerial photography for measuring stocking levels is described. Case studies from British Columbia are used, which involve sites with natural regeneration of yellow-cedar. Height growth for these seedlings is reported.


Provides evidence that the identity of the fungus isolated by Hansen et al. (1988) from yellow-cedar forests is *Phytophthora gonapodyides*.


Lists scientific, standard, and common names, sources of supply, and wood properties of many woods, including yellow-cedar.


Gives a key to the three species of *Chamaecyparis* in North America and a description of yellow-cedar using the name, “Sitka cypress.” Indicates that yellow-cedar is cultivated widely in Europe under the name "Thujopsis borealis".


Discusses the history, advantages, and problems of using rooted cuttings for reforestation. Planting rooted cuttings for reforestation dates back to at least 1400 AD in Japan. Mentions that difficulty in obtaining seed and poor seed germination have prompted the testing of rooted cuttings for regenerating high-elevation sites in British Columbia.

Yellow cedar is a conspicuous tree of the Canadian zone between 3,000 and 5,000 ft. Foliage is scalelike, the bark is ash gray and flaky, cones are small and globular, and the branches have a characteristic drooping appearance as if wilted. This latter character is particularly noticeable along the Paradise Valley highway between Ricksecker Point and Narada Falls.

100. **Brockman, C. Frank. 1949.** Conifers of the Cascades University of Washington Arbor Bulletin 12 11 13

Just below the subalpine meadow country in the Cascades, the most characteristic tree association is composed of noble fir, yellow-cedar, and western white pine. Intermingled with these principal species are Douglas-fir and western hemlock.

101. **Brockman, C. Frank. 1949.** Trees of Mount Rainier National Park Seattle University of Washington Press 49 p

Yellow-cedar is a component of the intermediate forest in elevations from 4,000 to 5,200 ft, the subalpine forest, from 5,000 to 6,500 ft, and the timberline forest from 6,500 to 7,000 ft. In the park, it is found most easily along the Paradise Valley highway in the vicinity of Canyon Rim and Narada Falls. It is a medium-sized tree from 75 to 100 ft tall and from 1-1/2 to 2 (occasionally 3) ft in diameter, but smaller in exposed situations. A general description is given.

102. **Brooke, R.C. 1965.** The subalpine mountain hemlock zone Part II Ecotopes and biogeocenotic units In Krajina V J , ed Ecology of western North America Vancouver BC University of British Columbia, Department of Botany 79-101 Vol 1

The subalpine mountain hemlock biogeoclimatic zone occurs on the crests and slopes of innumerable peaks or ridges forming the Coast Ranges, and in the study area which includes part of Garibaldi Park and the North Shore Mountains, it is found at elevations between about 3,000 and 5,500 ft. The zone is characterized in detail. Within the forested biogeocenotic units, yellow-cedar occurs in association with *Tsuga mertensiana* and *Abies amabilis*. Understory vegetation also is listed.

103. **Brooke, R.C; Peterson, E.B.; Krajina, V.J. 1970.** The subalpine mountain hemlock zone In Krajina, V J , Brooke, R C , eds Ecology of western North America No 2 Vancouver, BC Department of Botany, University of British Columbia 349 p Vol 2

A detailed synthesis on the climate, soils, and ecosystems of the subalpine zone in British Columbia. Yellow-cedar has a varied distribution in this zone and, as a productive tree, is confined to habitats with abundant moisture and those with seepage supply. Yellow-cedar does not grow well or is absent from mesic habitats where seepage is lacking and deep organic accumulation is extremely acidic.

Describes general characteristics and minute anatomy of many woods. Yellow-cedar has an odor resembling that of raw potatoes with a faint, bitter, somewhat spicy taste. The wood is comparable to that of *Chamaecyparis lawsoniana*.


Appendices contain standard cubic-foot volume tables and merchantable volume factors for yellow-cedar.


Provides descriptions of yellow-cedar's general appearance, foliage, flowers, cones, seeds, bark, and wood. Gives a map of the known distribution.


Notes the occurrence of yellow-cedar on Graham and Moresby Islands in the Queen Charlotte Islands of British Columbia.


The probable structure of nootkatin is described and illustrated.


A detailed description of the genus *Cupressus* and its members. The author suggests that yellow-cedar and other *Chamaecyparis* species should reside in the genus *Cupressus*. The author does recognize the similarity among species often referred to *Chamaecyparis* and groups them together in a subgenus (section) of *Cupressus*. Morphology, horticultural varieties, and uses are discussed.


A preliminary study of the steam-volatile constituents of the heartwood of yellow cedar resulted in the isolation of carvacrol, the sesquiterpene type tropolone nootkatin, C_{15}H_{20}O_{2}, and a new acid, C_{10}H_{14}O_{2}, for which the name “chamic acid” is proposed


A new family is erected for a fungus found infecting yellow-cedar foliage and twigs in the Cascade Range. Details of the fungus’ morphology and growth in culture are given


Reports on a study of ray parenchyma cells in yellow-cedar wood. Thickening in the ray parenchyma wall adjacent to the tangential boundaries of longitudinal tracheids are described and illustrated


Mentions the presence of an isotropic layer in xylem parenchyma cell walls for various tree species. Yellow-cedar is among other conifers in lacking these layers in both axial and ray parenchyma


Analysis of the leaf oil from yellow-cedar indicates that a-pinene, 3-carene, and limonene are the main constituents. A number of minor constituents were identified, some of them common in the Cupressaceae, some unique to yellow-cedar


Two new compounds are reported from leaf oil of yellow-cedar 8-epimanoyl oxide and 8,13-diepimanoyl oxide

Genetic variation in growth, morphology, and frost hardiness was measured in the progeny from seven open-pollinated families in coastal British Columbia. Provenances differed in percentage germination, shoot dry weight, shoot-to-root dry weight ratio, number of lateral branches per stem, and cold injury. Families differed in height, root collar diameter, and the number of nodes of primary foliage.


Tables contain consensus as to conifers suited for particular uses. Yellow-cedar is shown suitable for the following situations: parks, large gardens and pleasure grounds, smaller gardens, rock gardens, and windbreaks.


Contains a series of papers that include information on yellow-cedar grown in Great Britain. Also lists statistics on notably large trees.

123. **Clark, R.H.; Lucas, Colin C. 1926.** The essential oil content of *Chamaecyparis nootkatensis* Transactions of the Royal Society of Canada, Section III. 20: 423-428.

The appearance and some properties of oils distilled from both the foliage and heartwood of yellow-cedar are described. The major constituents of leaf oil seem to be a-pinene, b-pinene mixed with sabine, limonene, and p-cymene.


A report on supply and market conditions for western redcedar and yellow-cedar growing in Alaska, prepared for the USDA Forest Service.


Describes briefly the color, characteristics, durability, and suitable uses of yellow-cedar wood.


Describes pollen production in yellow-cedar and feeding damage by a mite. Cones and seeds can develop to maturity in 1 yr with warmer and drier conditions at lower elevations in British Columbia. Germination rates from these first-year cones are reported.

The Hudsonian zone from 3,500- to 5,000-ft elevation is characterized by the yellow-cedar, subalpine fir, mountain hemlock climax. Yellow-cedar is shown to be host to 17 species of lichens and two species of mosses.


Describes horticultural uses and culture of many conifers, including yellow-cedar.


Gives a description and some general information on yellow-cedar. Includes photographs, a line drawing of foliage and cones, and a distribution map.


Briefly mentions plant communities where yellow-cedar is found in the Cascade Range.


Mentions observing yellow-cedar under the name *Tsuga heterophylla* but does not give the specific location in southeast Alaska.


Includes yellow-cedar in a list of plants collected by David Brink near Crillon Lake on the west flank of the Fairweather Range, Alaska.

The author observed yellow-cedar in the Prince William Sound region at its northwestern limit on Glacier Island, where it is locally abundant and thrifty. A resident fox farmer reported yellow-cedar trees with diameters up to 3 ft. The isolated occurrences in the Prince William Sound area present an interesting phytogeographic problem, but the species is said to be of little importance ecologically.


Yellow-cedar is listed as one of the 12 character trees of the province.


Examination of a branch of *C. nootkatensis* showed a definite sexual "spectrum," with the apex sterile, the female conelets borne on the intermediate portion of the branch, and the male on the oldest, basal part. (From Courtot and Baillaud's summary)

139. Coville, Frederick Vernon; Funston, Frederick. 1895. Botany of Yakutat Bay, Alaska, with a field report. Contributions from the United States National Herbarium 3(6) 325-353

One small yellow-cedar tree was reported near the Native village on Khantaak Island across from Yakutat.


The cedar bark beetle, *Phloeosinus squamosus*, continued activity over much of southeast Alaska in 1964. The rather considerable tree killing was confined to stands of yellow-cedar with low commercial value.


A fungus associated with black heartwood in yellow-cedar produces abundant yellow crystals when grown in culture. The major constituent of these crystals was identified as 1-hydroxy-3-methyl anthraquinone. The compound was synthesized and tested for its toxicity against various fungi. Very negligible toxicity was found, but it did reduce the conidial sporulation of the fungus *Trichoderma virgatum*.

The following carotenoid compounds were found from leaf oil of yellow-cedar, lutein epoxide (the most abundant, comprising 33 percent of carotenoids), rubixanthin, B-carotene, B-cryptoxanthin, violaxanthin, heoxanthin, mutatoxanthin, and rhodoxanthin.


144. Dallimore, W.; Jackson, A. Bruce. 1923. A handbook of Coniferae including Ginkgoaceae. 3d ed. London: Edward Arnold and Co. 570 p

Includes a general description of yellow-cedar, its wood, uses, silvical characteristics, list of varieties, and experience with plantings in Great Britain.


The synthesis of nootkatone and vetivone are used to exemplify a new method of stereoselective construction of eremophilane sesquiterpene skeletons. The former compound, nootkatone, has been isolated from both the heartwood of yellow-cedar and the peel oil of grapefruit.


Description of yellow-cedar with comments on range, uses. Beautiful illustrations of foliage (in color), flowers, cones, and seeds.


The author proposes a system for abbreviating tree names in the vernacular. Simple rules are set forth and a list of abbreviations presented. The following is proposed for Chamaecyparis nootkatensis: abbreviation—CHn; English vernacular—yellow cypress; French vernacular—Chamaecyparis jaune.


Yellow-cedar is listed among trees with natural ranges that are restricted to Western States of the United States.

Four tables give cubic-foot and board-foot volume estimates for yellow-cedar in southeast Alaska.

150. **DeMeo, Tom; Martin, Jon; West, Randolph. 1992.** Forest plant association management guide, Ketchikan Area, Tongass National Forest. R10-MB-210 Juneau, AK US Department of Agriculture, Forest Service, Alaska Region. 405 p

Describes the occurrence of yellow-cedar in several plant association series in the southern portion of southeast Alaska. Provides details regarding associated vegetation and site factors for each series.


Lists shrinkage values for lumber of different tree species including yellow-cedar.


Lists drying schedules for lumber of different tree species including yellow-cedar.

153. **Dirr, Michael A.; Frett, John J. 1983.** Rooting of Leyland cypress as affected by indolebutyric acid and boron treatment. Hortscience 18(2) 204-205

The effect of using hormone and boron dips on the rooting success of cuttings from Leyland cypress is reported. Indolebutyric acid (IBA) treatment used at 0 8 and 1 6 percent resulted in 90 percent rooting compared to low percentages for boron treatment or controls. Plant survival was best at concentrations of 0.3 to 0.8 percent IBA for root dips. The highest levels of IBA caused foliar necrosis.

154. **Dixon, Dorothy. 1961.** These are the champs American Forests 67(1) 41-50

The largest yellow-cedar reported is located in Olympic National Park, Washington. Circumference at 4-1/2 ft is 21 ft, height is 175 ft, and spread is 27 ft 5 in.


Yellow-cedar is found on mountain ridges below 3,500 ft in the Olympic Mountains in Washington.

Summarizes results of cutting trials for 1959 and 1960. Two varieties of *Chamaecyparis* were tested, var. *glauca* and var. *pendula*.


This is the original botanical description for yellow-cedar under the scientific name “*Cupressus Nootkatensis.*” The only common name used is “Nootka cypress.” The formal description is made from a specimen collected by Archibald Menzies in 1793 on the shores of Nootka Sound on Vancouver Island in British Columbia while circumnavigating the world with Captain Vancouver. David Don apparently wrote the species description as Lambert states in the preface of his book, “I have here to acknowledge my obligations to Mr. Don, for the pains he has taken forming the Descriptions, and the accurate manner in which the whole has been executed.” Thus, David Don is the authority and the species is referred to as *Cupressus nootkatensis* D. Don rather than *Cupressus nootkatensis* Lambert. The latter authority, sometimes abbreviated as “Lamb.,” is used frequently in older literature. The most commonly accepted current scientific notation adds the name Spach because in 1842 the French botanist Edouard Spach placed the taxon in the newly erected genus *Chamaecyparis*. *Chamaecyparis nootkatensis* (D. Don) Spach. In an appendix, Don also describes the collection of the Lambertian Herbarium with a list of the sources of herbarium specimens. The 21st entry mentions plants that were collected by Menzies, this probably includes the type specimen for yellow-cedar.


Describes the Krummhotz forest canopy, which includes yellow-cedar, on an alpine ridge in the North Cascades National Park. Yellow-cedar did not occur in the burned portion of the area 29 yr after fire.


Reports an infestation of western redcedar and yellow-cedar by the bark beetle *Phloeosinus squamosus*. The outbreak was confined to scrub cedar stands on poorly drained slopes and muskeg bottoms on Kuiu Island, Alaska.

A cedar bark beetle, *Phloeosinus squamosus* Blkm., is reported to be responsible for the death of large numbers of yellow-cedar and western redcedar on Kuiu and Kupreanof Islands. The outbreak extended over several thousand acres and was confined primarily to scrub cedar stands.


From X-ray evidence, describes the chemical structure for the tropolone nootkatin, C_{15}H_{20}O_{2}, from the heartwood of *Chamaecyparis nootkatensis*.


Describes the isolation and chemical structure of nootkatin, a tropolone compound from the heartwood of yellow-cedar. Outlines reactions used to demonstrate its structure.


Describes the appearance, life histories, and damage of three moths, a scale insect, and a bark beetle that attack members of the Cupressaceae in British Columbia. The cypress tip moth, cypress leaf tier, and redwood bark beetle may be the most damaging to yellow-cedar.


Reports a study on the biology and impact of the gall midge of yellow-cedar. Provides information on the life cycle of the midge, distribution in British Columbia, history of damage, and hosts that it infects.


*Cupressus nootkatensis* (yellow-cedar), or as it is perhaps better known, *Thuypopsis borealis*, is one of the hardiest and most beautiful of the cypresses, and appears to thrive everywhere in the British Isles. It is somewhat branchy for a timber tree, but when planted close, it forms a clean straight stem. The tallest tree recorded in Britain is at Murthyly: 50 ft high and 1 ft 9 in in girth. Dimensions of several other large trees are given.

Announces the yellow-cedar working group. Contains objectives of the group and mentions plans for a workshop.


Lists ongoing research topics and interests among the group in operational topics. Contains news and brief articles on common and scientific names for yellow-cedar, questions of planting trials, and tissue culture.


Contains news and brief articles on a gall midge, dieback of stands in Alaska, wood properties, tree breeding, log sales, and several aspects of rooted cuttings.


Contains news and brief articles on micropropagation, clone transfer, and frost hardiness, wood properties, market development, longevity, a meeting in Japan, and clonal studies.


Contains brief articles on genetic variation, donor stock registry, cone and seed development, growth and yield, monthly timber prices, micropropagation, and names for yellow-cedar.


Macrofossil evidence, especially from foliage, was used to reconstruct the composition of the forests on Mount Rainier. Yellow-cedar has been abundant since 3400 and 5000 yr BP at two sites and present in small numbers since 1500 yr BP at another site. The occurrence of yellow-cedar and other species is used to interpret the past climate and fire conditions.


Lists a specimen of yellow-cedar from Sitka, Alaska, under the name "Cupressus nutkatensis" Hook among many plants collected by Albert Kellogg of the United States Coast Survey.

Discussing the occurrence of yellow-cedar in forest communities along the central portion of the west side of the Cascade Range in Oregon

174. **Eades, H.W. 1932.** British Columbia softwoods, their decays, and natural defects Bull 80 Ottawa Canada Department Interior, Forest Service 126 p

175. **Earl, Derek. 1958.** Yellow cedar (*Chamaecyparis nootkatensis* (D Don) Spach) Quarterly Journal of Forestry 52(3) 204-207 [plus 1 plate]

Discusses the silvics of yellow-cedar in its natural range, particularly in British Columbia. Includes notes on its timber characteristics and the history of the species in Great Britain

176. **Ebell, L.F.; Schmidt, R.L. 1964.** Meteorological factors affecting conifer pollen dispersal on Vancouver Island Publ 1036 [Place of publication unknown] Canada Department of Forestry, Forest Research Branch 28 p


In a test of daily and seasonal flowering during 1958 and 1959 on Vancouver Island, the following order of flowering among conifers was observed: *Tsuga heterophylla, Chamaecyparis nootkatensis, Pseudotsuga menziesii, Abies grandis, A amabilis, Pinus contorta, P monticola, A lasiocarpa,* and *T mertensiana.* Flowering began later with increasing elevation, but pollen production did not decrease with elevation.

178. **Eckblad, F.E. 1968.** The genera of the operculate Discomycetes a re-evaluation of their taxonomy, phylogeny, and nomenclature Nutt Magasin for Botanikk (Oslo) 15 1-191

Mentions that the fungus *Gelatinodiscus flavidus* occurs on yellow-cedar in British Columbia

179. **Edlin, Herbert L. 1964.** A modern "sylva" or "a discourse of forest trees" cypresses conifers of the *Cupressus* and *Chamaecyparis* genera Quarterly Journal of Forestry 58(3) 208-217

Yellow-cedar appears well suited for growth in the colder districts of Great Britain, although it is little used as a plantation tree, possibly because of its slow rate of growth. This is a common feature of all trees from the far North. The tree is described briefly. The intergeneric hybrid, Leyland cypress, also is mentioned briefly. The largest tree at Leighton Hall, planted in 1911, is 82 ft tall and 8-1/2 ft in girth.

Patterns of tree death, growth and replacement in old-growth forests of the Hoh River valley in Washington are reported. Yellow-cedar was common (36 percent of the tree population) at the Hoh Lake study site. It appeared to be underrepresented in the smallest diameter class (<5 cm). Yellow-cedar experienced an annual mortality rate of 3 percent in this area.


Discusses the advantages of using Polaroid film to quickly determine the proportion of filled seed of yellow-cedar and other conifers with small seed.


Provides detailed analyses of foliage characteristics that aid in the distinction of species of Chamaecyparis, Cupressus, Thuja, and others. Suggests that the closest relative of yellow-cedar is the now-extinct Chamaecyparis cordillerae. Shows the Tertiary distribution of yellow-cedar fossil allies, which includes locations in Nevada, Idaho, Wyoming, Montana, Oregon, Washington, and British Columbia.


Provides morphological descriptions of the reproductive cycle of conifers. Gives specific details regarding yellow-cedar, including color illustrations of male and female flowering, female cones, and seeds of yellow-cedar.

184. Eis, Slavoj. 1962. Statistical analysis of several methods for estimation of forest habitats and tree growth near Vancouver, B C For Bull 4 Vancouver University of British Columbia 76 p


The development of an abbreviated reproductive cycle by yellow-cedar (i.e., producing seed in first-year cones) is viewed as a plastic response by individuals to a favorable environment rather than a genotypic adaptation. A large range of
germination success was found among genotypes of yellow-cedar that produced first-year cones. Variance was greatest among seedlots from high elevations, thereby implying there is greater cost for fitness in those sites. Phenotypic plasticity may be a trait by itself that is genetically variable and responsive to selection.


The genetic control of germination is reported from a study of yellow-cedar and three other tree species. Seeds collected from 12 open-pollinated trees were used for the tests for yellow-cedar. Yellow-cedar had the lowest germination rate and germination capacity (27 to 68 percent of seeds) and showed broad-sense heritability in the variation of germination.


The properties of seed from mature-appearing, but 1-year-old, cones were studied from yellow-cedar trees growing in a seed orchard at low elevation on Vancouver Island, BC. Germination of seed from first-year cones ranged from 10 to 42 percent for pollinated cones, and embryos appeared similar to those from second-year cones. The authors concluded that cone development in yellow-cedar is temperature dependent and that viable seed can be produced in first-year cones in warm climates.

189. Enari, Leonid. 1956. Plants of the Pacific Northwest Portland, OR Binfords and Mort 315 p


Wood laminates of yellow-cedar and western larch, adhesive bonded with three commercial phenol resorcinol formaldehyde adhesives, were exposure tested. Based on 18 mo outdoor exposure, the authors concluded that laminates of yellow-cedar and western larch made according to described specifications should be satisfactory for marine service use.


Yellow-cedar occurs only occasionally on Mount Baker and in association with mountain hemlock and subalpine fir.

Yellow-cedar heartwood was found to contain at least one new tropolone derivative called nootkatin. The wood also contains carvacrol LIII, a terpenoid phenol, formerly known among conifers only in the genus Tetraclinis.


Indicates that several of the constituents of yellow-cedar heartwood are fungicidal nootkatin, chamic acid, and chaminic acid. Discusses the structure of nootkatin and other tropolones from wood.

194. Erdtman, H.; Harvey W.E. 1952. The chemistry of the natural order Cupressales IX Nootkatin Chemistry and Industry 71 1267

Results of different reactions are given as evidence for determining the chemical structure of nootkatin.


Describes the structure of chamic and chaminic acids, derived from the heartwood of yellow-cedar. Chaminic acid is been shown to be the optical antipode of isochamic acid.


The authors suggests that yellow-cedar be separated in its taxonomy from other Chamaecypans based on the manner in which its heartwood constituents differ from the other species.

197. Erdtman, H.; Topliss, J.G. 1957. The chemistry of the natural order Cupressales XVIII Nootkatene, a new sesquiterpene type hydrocarbon from the heartwood of Chamaecypans nootkatensis (Lamb ) Spach Acta Chemica Scandinavica 11 1157-1161

A preliminary study of the neutral constituents from the wood of yellow-cedar describes terpenoid hydrocarbons, alcohols, compounds containing carbonyl, and carvacrol methyl ether. Nootkatene is isolated in an apparently pure state.

198. Erdtman, Holger; Hirose, Yoshiyuki. 1962. The chemistry of the natural order Cupressales 46 The structure of nootkatone Acta Chemica Scandinavica 16 1311-1314

Nootkatone, a new eudalenoid sesquiterpene ketone, is isolated from heartwood of Chamaecypans nootkatensis.

Mentions the occurrence of yellow-cedar in several cover types along the northern Pacific Coast


Lists the fungi known to occur on Chamaecyparis in the United States, including those on yellow-cedar


Gives cubic-foot volume tables for Thuja plicata and Chamaecyparis nootkatensis and board-foot volume tables for the two species combined


Reports on nutrient loss associated with slash burning as influenced by slash and forest composition Nutrient loss was highest with increasing slash loads of western redcedar and yellow-cedar


Briefly describes uses of yellow-cedar and its occurrence near the limits of its range in Prince William Sound, Alaska Wood and bark were used at the Native village at the foot of Copper Mountain Direct observations were not made on the occurrence of yellow-cedar trees, but information from fur traders suggested that yellow-cedar grows on Hawkins Island, 6 or 7 mi from Orca on Glacier Island opposite Columbia Glacier, and in a few other localities

205. Fink, S. 1991. Comparative microscopical studies on the patterns of calcium oxalate distribution in the needles of various conifer species Botanica Acta (Germany) 104(4) 306-315

The distribution of calcium oxalate crystals is described in the foliage of a number of conifers including yellow-cedar Yellow-cedar and other members of Cupressaceae have numerous crystals in radial phloem, mesophyll, and epidermal cells Crystals may form when excessive calcium is pumped out of protoplasm

Presents a comprehensive description of the conifers, based on foliage morphology, in the form of an artificial key Eighteen species of Cupressus and Chamaecyparis are listed, including yellow-cedar


Gives common names, the distribution, a general description of the tree, and comments on the properties and uses of wood for yellow-cedar Mentions that the wood sells for $3000 to $5000 per thousand board feet and is mostly exported to Japan The wood can reportedly be found among driftwood along the Oregon coast


The effects of nursery treatments and spring or fall planting were assessed for yellow-cedar rooted cuttings Cultural treatments produced no significant effect on physiology during the first growing season Moisture stress resulted in smaller stecklings (rooted cuttings) than well-watered treatments, but there were no differences after the first year Extreme conditions soon after fall planting reduced survival compared to planting in spring After the second year, both populations were similar in shoot development, but spring-planted cuttings had greater root development

209. Folk, Raymund S.; Grossnickle, Steven C; Russell, John H. 1995. Gas exchange, water relations and morphology of yellow-cedar seedlings and stecklings before planting and during field establishment New Forests 9 1-20

Seedlings and stecklings (rooted cuttings) were compared for their response to limited environmental conditions Stecklings had equal or greater growth, similar gas exchange under moderate conditions, and higher gas exchange under high evaporative conditions than did seedlings Under cold soil or drought conditions, seedlings had greater gas exchange Seedlings generally had greater root development The planting of seedlings rather than stecklings is recommended on sites with cold soils or limited soil moisture in British Columbia


211. Forest Products Laboratories Division (Canada). 1951. Canadian woods, their properties and uses 2d ed Ottawa King's Printer 367 p

Tabulations of physical and mechanical properties are included in the appendix


Reports on a study of drying rates of woody fuels from six tree species including yellow-cedar.


Contains a revision of silvical characteristics of yellow-cedar from Andersen (1959).


The occurrence of yellow-cedar in several plant communities is described. Yellow-cedar is of intermediate importance among possible climax species. The park's oldest tree is a yellow-cedar over 1200 yr old


An illustrated key to seedling identification. Yellow-cedar seedlings have two (rarely three) cotyledons that are flat in cross section and less than 12 mm long, juvenile needles are not glaucous


Yellow-cedar is listed as a minor tree species occurring in the true fir-hemlock zones of 6 of 11 ecological provinces of Oregon and Washington.

Includes a discussion on the occurrence, size, longevity, plant communities associated vegetation, and successional status of yellow-cedar in Oregon and Washington. Yellow-cedar occurs in the *Tsuga mertensiana* zone where it is a major component along the west side of the Cascades and in the Olympic Mountains. Yellow-cedar is a minor component of the upper limits of the *Abies amabilis* zone in western Washington. It is noted along the Columbia Gorge with other tree species between 1000 and 1500 m elevation. Yellow-cedar is a timberline tree species in some areas, especially as a major Krummholz cover in the Washington Cascade Range and northeastern Olympic Mountains. The only conifer tree species capable of surviving and reproducing on recurrent avalanches is yellow-cedar. Yellow-cedars longevity is estimated to be 1000+ years, and it is listed as shade tolerant.

221. **Franklin, Jerry F.; Hemstrom, Miles A. 1981.** Aspects of succession in the coniferous forests of the Pacific Northwest In Forest succession concepts and application New York Springer-Verlag 212-229

222. **Franklin, Jerry F; Mitchell, Russel G. 1967.** Successional status of subalpine fir in the Cascade Range Res Pap PNW-46 Portland OR U S Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station 16 p

A table indicates the forest provinces in which subalpine fir grows with yellow-cedar in Oregon and Washington.

223. **Franklin, Jerry F.; Trappe, James M. 1963.** Plant communities of the northern Cascade Range a reconnaissance Northwest Science 37 163-164

Yellow-cedar joins silver fir and mountain hemlock as the climax of a community at high elevation in the north Cascade Range of Washington. Yellow-cedar is also part of an avalanche community maintained as a topographic climax.


A disjunct 4 3-ha stand of yellow-cedar is described from the Aldrich Mountains in central Oregon. Associated vegetation is listed. The author suggests that this occurrence is a relic that resulted from fragmentation of a previously more extensive distribution for yellow-cedar.


Describes the yellow-cedar mortality problem in Alaska and early efforts to determine its cause.

Discusses the planting of snowbreaks along the railroad, which reaches an altitude of 680 m, across Saltfjell, north of the Arctic Circle.


Water quality improves when the water is stored in tanks constructed of yellow-cedar and three other tree species.


The new species *Engelhardtia alba* is described as a mycoparasite on the fungus *Cytospora abietis*, which itself occurs on the bark of yellow-cedar.


Fungi on yellow-cedar and two other members of Cupressaceae are reported from British Columbia. Those on yellow-cedar are *Kabatina thujae*, *Cytospora abietis*, *Pleospora laricina*, *Pestalotia tunerea*, and *Pestalotia thujae*. *Kabatina thujae* caused a severe dieback on yellow-cedar in nurseries and ornamental plantings.


Describes four fungi that occur on the stems of yellow-cedar.


Describes four fungi that occur on the foliage of yellow-cedar.


Describes dieback of young yellow-cedar in nurseries in the Fraser Valley. The pathogen is the fungus *Kabatina thujae*, the cause of a similar disease in Europe.


Describes insects that attack yellow-cedar, including several *Phloeoosinus* bark beetle species and the roundheaded borer, *Atimia hoppingi*. 

Forest floor organic materials were surveyed 2 yr after spring and fall slash burning on sites with yellow-cedar and other conifers on Vancouver Island. Slash burning did not reduce nitrogen availability below levels required to support plantation growth, except in situations of severe burns on coarse-textured soils.


A new genus and species of midge are described from specimens that attack and form galls on yellow-cedar in British Columbia. The life cycle of the midge is outlined. Illustrations of the galls caused by the insect are given.


Gives a description of yellow-cedar, growth rates, elevational limits, and specific locations of large, old specimens in British Columbia.

237. **Garrison, George A.; Bjugstad, Ardell J.; Duncan, Don A. [and others]. 1977.** Vegetation and environmental features of forest and range ecosystems. Agric. Handb. 475 Washington, DC U.S. Department of Agriculture, Forest Service 68 p

Lists and describes the major forest ecosystems of the United States.

238. **Garth, Coward. 1992.** Tree book, learning to recognize trees of British Columbia. Victoria, BC Province of British Columbia, Forest Service Information Division, Forestry Canada

Gives a brief description of yellow cedar. Includes illustrations of the tree, foliage, cones, and bark.


Describes soils and vegetation on a portion of Prince of Wales Island, Alaska. Yellow-cedar grows from sea level to about 1,500 ft and occurs on the following soils series: Maybeso, McGilvery, St Nicholas, and Wadleigh.


Chamic acid, a chemical component of yellow-cedar heartwood, is synthesized and the steps for synthesis are given.

Lists common names and describes the appearance and range of yellow-cedar. Discusses the properties and uses of yellow-cedar wood and speculates about market applications.


Describes *K thujae*, the cause of shoot dieback of several cedar species, including yellow-cedar, in western Europe and Canada.

243. **Gorman, M.W. 1896.** Economic botany in southeastern Alaska. Pittonia. 3 8-75

Mentions that yellow-cedar is probably the most valuable tree grown in southeast Alaska. The wood is used for making oil crates, boxes, bowls, dishes, bakers, masks, spoons, and household utensils. Roots are split and used in basket making.


Yellow-cedar was observed above 4,000 ft, but only around Slate Mountain. Only small trees were seen, some of these bearing fertile cones. Dead trees, up to 20 in in diameter, were remnants of a stand previously destroyed by fire.


Yellow-cedar, formerly thought to reach its southern limit in Oregon, is now known to be fairly common on Mount Jefferson and Whiskey Peak (Josephine County) 3 mi from the California border. On Mount Hood, yellow-cedar is found on moist slopes on the south and west sides up to 4,000 ft.


Within the region described, yellow-cedar is found only in moist ravines or canyons that head in or about the main divide of the Cascade Range. Its elevational range is from 2,100 ft on the Stehekin to 6,000 ft about the headwaters of the Methow River and Rattlesnake Creek. Finest specimens range from 50 to 75 ft tall and 10 to 25 in in diameter. At its upper limits, the tree is stunted with an alpine appearance.

247. **Gorman, Martin W. 1929.** New stations for trees in Oregon Madrono 1 275

The author collected a specimen of yellow-cedar from Whiskey Peak, Josephine County, Oregon, 3 mi from the California border.

The susceptibility of yellow-cedar wood and that of several other species by feeding of the Formosan subterranean termite was evaluated in laboratory tests. Significantly less feeding occurred on yellow-cedar and redwood than on Douglas-fir and southern pine. Reduced feeding often resulted in termite mortality indicating heartwood compounds are toxic to termites. Feeding on yellow-cedar resulted in the highest termite mortality. When presented with redwood and yellow-cedar, termites preferred feeding on redwood.


Gives the occurrence of yellow-cedar at the limits of its range around Prince William Sound, Alaska.


Compounds from wood are tabulated (mean values obtained in percentage of oven-dry wood).


Gives a concise description of yellow-cedar, including silvics, morphology, and uses.


Provides anatomical key and illustration of yellow-cedar.


Yellow-cedar is a component of the Hudsonian zone near timberline at 5,000 ft and one of the dominant trees where the transition zone merges into the Canadian zone at 4,000 ft.
255. **Griffin, James R.; Critchfield, William B. 1972.** The distribution of forest trees in California Res Pap PSW-82 Berkeley CA U S Department of Agriculture Pacific Southwest Forest and Range Experiment Station

Describes several disjunct populations of yellow-cedar that occur in the Siskiyou Mountains of northern California

256. **Griffith, Randy Scott. 1992.** *Chamaecyparis nootkatensis* In Fischer, William C., comp The fire effects information system [Database] Missoula, MT U S Department of Agriculture, Forest Service, Intermountain Research Station, Intermountain Fire Sciences Laboratory Magnetic tape reels, 9 track, 1600bpi, ASCII with Common LISP present

Provides a good deal of general information on yellow-cedar with an emphasis on ecology and fire effects Discusses the occurrence of yellow-cedar in major plant community classifications Reviews studies of fire on sites where yellow cedar was present Contains numerous references on yellow-cedar Available on the World Wide Web at http://www.fs.fed.us/database/feis/plants/tree/chanoo

257. **Gripenberg, Jarl. 1953.** The constituents of the heartwood of the genus *Thuja* and some related genera Journal of Scientific and Industrial Research (India) 12A(5) 233-237

Reviews information on the constituents of *Thuja plicata*, *T. occidentalis*, *Chamaecyparis obtusa*, *C. nootkatensis*, and *Thujopsis dolabrata*


Summarizes information on the physiology of yellow-cedar regeneration Frost hardiness, drought tolerance, and stomatal control are discussed

259. **Grossnickle, S.C.; Russell, J.H. 1990.** Water movement in yellow-cedar seedlings and rooted cuttings comparison of plant and root system pressurization methods Tree Physiology 6 57-68

Water movement in rooted cuttings and seedlings of yellow-cedar was studied in a controlled environment Seedlings developed root growth more quickly Root resistance to water movement initially decreased as new root area was produced but then leveled off Water stress in newly planted stock can be reduced by increased root development because of improved root-soil contact and by decreased root water resistance

Reports on a study designed to test the effect of donor plant maturity on rooting process and identify when rooted cuttings begin to respond in a manner similar to seedlings. Juvenile stock experienced less physiological stress and rooted more quickly than older material. Rooted cuttings showed photosynthetic activity comparable to seedlings 20 weeks after rooting.


Gas exchange in rooted cuttings of yellow-cedar was measured in response to light levels, vapor pressure deficit, root temperature, and soil moisture. Results indicated that yellow-cedar requires a high level of photosynthetically active radiation to reach light saturation and is more sensitive to increased vapor pressure deficit, low root temperatures, and reduced soil moisture than are other associated conifer species.


Rooted cuttings from donor plants with different levels of maturation were measured for physiological response and morphological development during the rooting process. Hedging reduced donor plant water stress patterns and increased their foliage conductance. Cuttings taken from donor hedges (compared with open grown trees) had improved rooting and speed of rooting capability.


Reports results from a study on the effect of photoperiod, air and soil temperature, and soil moisture on water relations of rooted cuttings. Yellow-cedar maintained turgor maintenance through elastic and osmotic control, but primarily through osmotic adjustments when exposed to limited soil moisture or low temperature. The shoot water potential of yellow-cedar was comparable to other Northwest conifers.


On Goose Island, two plant associations are included in the general heading of coniferous forest, the typical coast climax association of western redcedar, western hemlock, and Sitka spruce, and another that includes western redcedar,
western hemlock in association with lodgepole pine, yellow-cedar, and Pacific yew. The latter is a stunted forest forming an ecotone between spruce, hemlock, and muskeg associations; it predominates in rocky areas. Floral composition is described by the Aldous method. Yellow-cedar occurred in 45 percent of bog-forest ecotones and 38 percent of bogs, with 15 percent and 5 percent canopy covers, respectively.


266. Hagvar, Sigmund; Kvamme, Torstein. 1977. Legnotus picipes (Fall.) new to Norway, and some notes on Cyphostethus tristriatus (F.) and Eurygaster testudinaria (Geoffr.) (Hem., Pentatomolidea). Norwegian Journal of Entomology 24 179-180

Juvenile and adult insects of the species Cyphostethus tnstnatus (F.) were recorded on yellow-cedar and Port-Orford-cedar growing in Norway. This is the first report of the insect on any host other than Juniperus communis. The insect is not known to occur in the native range of yellow-cedar or anywhere in North America.


Contains a key to the identification of woods commonly used in Canada. Features that distinguish yellow-cedar include the absence of resin ducts in unwounded wood, a nonwaxy or nonresinous appearance of wood, and heartwood that has a spicy, aromatic odor and sulphur-yellow color.


Yellow-cedar is a component of the coast forest region. Pacific silver fir and yellow-cedar occur generally, their ability to tolerate drier conditions being shown by their presence toward the upper limits of tree growth.


Indicates that yellow-cedar will respond favorably to single-tree selection method of timber harvesting.

Reports on attempts to recover species of *Phytophthora* from yellow-cedar forests in southeast Alaska. Pears were used as bait in the isolation process for these fungi. A species of *Phytophthora* was isolated seven times from the five locations. The fungus is presumed to be endemic in Alaska, but is probably not the cause of decline and mortality of yellow-cedar.


Five fungal taxa in the genus *Pythium* are reported from southeast Alaska, most of the successful sampling was from soils in dead and dying yellow-cedar forests and some from within 50 cm of dying yellow-cedar trees.


Describes trials of *Cupressocyparis leylandii*, which so far has proved to be a vigorous, reasonably hardy tree.


Yellow-cedar comprised 0, 16, and 0.6 percent of the rumen contents from 14 Sitka black-tailed deer on Admiralty and Chichagof Islands collected in January, February, and March, respectively.


The nutritive value of yellow-cedar and other browse species is analyzed and reported. Yellow-cedar has high values for in vitro dry matter digestibility, total ash, calcium, zinc, and low values for neutral detergent fiber, potassium, and manganese.

States that yellow-cedar foliage is an especially important winter food for Sitka black-tailed deer in southeast Alaska.


Values of digestible dry matter and digestible protein (47 and 2 percent, respectively) are given for yellow-cedar available for browse by Sitka black-tailed deer. A value of 12 kg/ha for yellow-cedar is used in a model of carrying capacity for deer in low-volume hemlock, mixed-conifer forests.


Yellow-cedar foliage comprised 14 percent of the feces and 11 percent of the rumen taken from 13 Sitka black-tailed deer in a study on their diet on Admiralty and Chichagof Islands in southeast Alaska. Maximum values for yellow-cedar taken from an individual deer were 51 percent of feces and 47 percent of rumen.


"Mr. Menzies was the first discoverer of this species. He obtained specimens from Nootka Sound, when Vancouver (with whom he sailed as surgeon and naturalist) stopped there in his celebrated voyage round the world; and from his specimens Lambert described it in his ‘Genus Pinus’. Yellow-cedar was introduced from the Botanic Garden of St. Petersburg into Europe, under the name of Thuyopsis borealis, about 1850, and is now plentifully distributed. Mr. R. Brown, who collected for the Edinburgh [h] British Columbia Botanical Association’ in one of his letters says, ‘Next morning looking about our neighborhood, we re-entered our canoe, hollowed out of Cupressus nutkaensis, the mats we sat upon being made of the fibre of the same tree, ropes of the same material, and occasionally of Thuya plicata.’" Notes on habits and habitat are given. Indicates that yellow-cedar was introduced into Denmark in 1870.


A Phytophthora species is isolated from yellow-cedar forests of southeast Alaska, but evidence from an inoculation trial is presented that suggests that this fungus is not the cause of widespread tree mortality.
280. **Hansen, Henry P. 1950.** Pollen analysis of three bogs on Vancouver Island, Canada Journal of Ecology 38 270-276

Yellow-cedar occurs at high elevations near timberline, but not at low elevations on the east side of southern Vancouver Island where this pollen analysis study was conducted. Yellow-cedar pollen was not found in peat deposits.


Yellow-cedar is a component of sites designated as IV and V. Generally these sites are from 2,500 ft to 4,500 ft in northern Washington and from 3,500 to 4,000 ft in Oregon. Site IV associates are western hemlock, Pacific silver fir, noble fir, and mountain hemlock. Site V associates are Pacific silver fir, mountain hemlock, and subalpine fir.


Notes the occurrence of western hemlock looper, cedar bark beetles, round-headed borers, and ambrosia beetles on western redcedar and yellow-cedar in southeast Alaska.


Briefly describes the discovery, uses, habits, and morphology of yellow-cedar, diagnostic features of the wood, and its microscopic anatomical features. Physical and mechanical properties are tabulated.


A report on yellow-cedar indicated a "medium" crop of both 1- and 2-year cones near Petersburg, Alaska. The only report from the Sitka district showed a crop failure.

Discusses the construction and history of the ship Politkofsky, built of yellow-cedar timber in Sitka in 1863


Contains 301 references, most with brief summaries, arranged alphabetically by author. Gives a subject index and a list of other tree species mentioned.


Illustrated article about yellow-cedar. Contains information on general appearance, range, nomenclature, stature, growth rates, flowering, cones, and historic and modern uses.


Provides a summary of the silvicultural and ecological knowledge on yellow-cedar. Covers a range of topics including common names, general appearance, wood supply in several regions, characteristics of bark, cones, seed, and foliage and the appearance, properties, and uses of wood.


Discusses flowering, cones, and seeds for the three North American species of Chamaecyparis, including yellow-cedar. Gives notes on flowering and seed dispersal dates, seed-bearing age, seed yields, and stratification for germination.


Describes the distribution, elevation, associated plants, growth forms, common names, supply, production, wood characteristics, and uses of yellow-cedar.


Summarizes a wide range of ecological and silvicultural information on yellow-cedar. Includes range, climate, soils, associated plants, flowering, seed production, vegetative reproduction, growth and yield, rooting, shade tolerance, damage agents, uses, and genetics.

Describes the occurrence of yellow-cedar in the forests of southeast Alaska. Yellow-cedar occurs in pure stands but more often is found scattered with other tree species. Its best development is on thin soils over bedrock or on well-drained soils. On the latter sites, however, it has difficulty competing with faster growing trees. Trees may reach 8 ft in diameter and over 120 ft tall. Shade tolerance in this part of its range is probably less than further south. Little is known about its silviculture or management but yellow-cedar wood is very valuable.


Describes the use of yellow-cedar by Native people in Alaska and by Russians and Americans in Sitka. Yellow-cedar was used for hull construction in boat-building in the 1800s because of the wood's durability. Selective harvesting of yellow-cedar for this purpose exhausted supplies along beaches as far as Sitka as the Peril Strait area.


Lists the largest known yellow-cedar in the United States as a tree with a diameter of 3.7 m (12.0 ft), height of 37 m (120 ft), and crown spread of 8.2 m (27 ft).


Rooted cuttings (stecklings) of yellow-cedar were grown in inert rooting medium and fertilized with seven nutrient solutions. The complete nutrient mix supplied in increasing volumes produced the maximum response in growth and photosynthesis. Deficiency of nitrogen resulted in the greatest reduction in growth. Nutrients supplied in excess resulted in luxury consumption and eventually led to plant death.


Frost hardiness was studied in yellow-cedar during winter to determine the influence of photoperiod and subzero temperatures on the processes of hardening and losing frost hardiness. Significant difference in frost hardiness of clones existed throughout the experiment. Frost hardiness was greater in stecklings.
(rooted cuttings) treated with a 6-hour than a 12-hour photopenod Night frost also significantly increased frost hardiness in controlled experiments. Stecklings in all treatments began to lose frost hardiness between January and March. Both photopenod and temperature appear to influence hardening, but losing frost hardiness seemed to be affected primarily by temperature. Losing frost hardiness proceeded at a much faster rate in stecklings formerly exposed to night frosts than in plants not subjected to subzero temperatures.


Seedlings subjected to increasing day lengths began to lose frost hardiness immediately and at a greater rate than seedlings under a constant photopenod. Seedlings in a decreasing photoperiod treatment maintained maximum frost hardiness for 42 days, then began to lose frost hardiness spontaneously. Results indicated that photoperiod influences the initiation and rate of losing frost hardiness in yellow-cedar, and maximum hardiness cannot be maintained indefinitely.


Seedlings and steckings (rooted cuttings) grown at high elevation were consistently more cold hardy than those at low elevation. Frost hardiness appears to have a genetic component as seedlings and steckings of parents from certain families and populations developed greater hardiness than stock of parents from other areas. Frost hardiness was not significantly different among seedlings and rooted cuttings taken from 4- and 12-yr-old hedges.


Mature pollen of yellow-cedar and several other species was bombarded with gold and bacterial plasmids to attempt gene transfer. Of the four conifers tested, yellow-cedar had the lowest level of gene transfer.


Forest statistics for Chelan and Douglas Counties are given as of 1959-60. On commercial forest land, the volume of yellow-cedar growing stock 5 0 in in diameter at breast height (d b h ) and larger was 3 million ft$^3$. Volume of yellow-cedar sawtimber 11 0 in d b h and larger was 10 million board ft (Scribner).

Forest statistics for southwest Washington, which includes Clark, Cowlitz, Lewis, Pacific, Skamania, and Wahkiakum Counties, are given as of January 1, 1964. On commercial forest land, the volume of yellow-cedar growing stock 5.0 in (diameter at breast height) (d.b.h.) and larger was 24 million ft³. Volume of yellow-cedar sawtimber 11.0 in d.b.h. and larger was 120 million board ft (Scribner).


Forest statistics for west-central Oregon, which includes Benton, Lane, Lincoln, and Linn Counties, are given as of 1963. On commercial forest land, the volume of yellow-cedar growing stock 5.0 in diameter at breast height (d.b.h.) and larger was 3 million ft³. Volume of yellow-cedar sawtimber 11.0 in d.b.h. and larger was 7 million board ft (Scribner).


Describes the vegetation at a site on Vancouver Island about 13,000 yr BP from analysis of profiles containing pollen and macrofossils. Pollen grains from western redcedar and yellow-cedar are "indistinguishable." From about 3000 yr BP to present, members of the Cupressaceae, presumed to be both western redcedar and yellow-cedar, shared canopy dominance with western hemlock. The author suggests that humus accumulation under cool and moist summers have favored the development of the two cedars.


Indicates that pollen of several members of Cupressaceae (western redcedar, yellow-cedar, junipers) are easily confused, thereby complicating estimates of historic abundance based on analyses of pollen profiles.

308. Hemstrom, Miles A.; Franklin, Jerry F. 1982. Fire and other disturbances of the forests in Mount Rainier National Park Quaternary Research 18 32-51

Yellow-cedar is included in a study of disturbance and vegetation in Mount Rainier National Park. Yellow-cedar was found to be less useful for dating disturbances than less tolerant tree species owing to its habit of sometimes regenerating under a forest canopy. The authors state that individual yellow-cedar trees may survive to be more than 1200 yr old in the park.

309. Hennon, P.E. 1986. Pathological and ecological aspects of decline and mortality of Chamaecyparis nootkatensis in southeast Alaska Corvallis, OR Oregon State University, Department of Botany and Plant Pathology 279 p Ph D dissertation

Dissertation on the pathology and ecology of yellow-cedar decline in southeast Alaska. Includes chapters on background information of yellow-cedar, dating tree death, epidemiology, fungi, pathogen testing, basal scars, foliar and soil nutrients, and reproduction.


Describes the decline and mortality phenomenon of yellow-cedar in Alaska and contrasts it with forest declines of ohia in Hawaii and of western white pine in Idaho and surrounding areas.


Lists the fungi reported on yellow-cedar throughout its natural range. Includes fungi from previous publications and those recovered during isolations and collections made on the host in Alaska. A total of 77 fungal taxa are reported from yellow-cedar.


Reports progress on the first planting trials of yellow-cedar in Alaska for regeneration. Survival was high on most sites except those with limited light or soil drainage. Height and diameter growth were best on burned clearcut sites. Grazing by deer and a shoot blight fungus caused form problems and some mortality.

Summarizes discussions on the biology and management of yellow cedar made during a meeting held in Sitka, Alaska. Provides background information on yellow-cedar, then describes current knowledge and management practices related to occurrence, natural reproduction, planting trials, animal damage, and decline and mortality. Future management considerations are discussed. Notes from a field trip are included.


Lists and discusses the destructive biotic agents of yellow-cedar, including fungi, nematodes, insects, and bears. A total of 80 fungi are listed. Also describes the widespread decline and mortality of yellow-cedar in Alaska.


Reports on the survival and growth of yellow-cedar seedlings planted in different combinations of exposure to light and soil drainage in southeast Alaska. Survival and growth are highest with maximum light and soil drainage. Damage to seedlings includes browsing by deer and shoot mortality caused by a pathogen. Planting recommendations include evaluating site characteristics, protecting seedlings from deer, and planting soon after timber harvest.


A pamphlet with color illustrations summarizes knowledge on yellow-cedar decline and mortality in Alaska.


Information on the morphology and ecology of yellow-cedar as part of a treatment of woody plants of the world.


Basal wounds occur on over one-half of yellow-cedar trees sampled in some forests of southeast Alaska. Wounds generally face upslope, do not girdle the tree’s circumference, and are most common in productive forest communities. Evidence is presented that implicates brown bears as the cause of most of the wounding.
Bole wounding is independent from the serious forest decline problem in Alaska but can cause loss of timber value through staining and wood decay. Includes photographs of bear scars and those caused during bark collection by humans.


Reports on studies that reconstruct mortality patterns of yellow-cedar decline from the 1880s to the 1980s in southeast Alaska. Mortality began on wet, poorly drained sites, and subsequent spread has been confined to 100 m on adjacent sites with better drainage. No long-range spread was found. Yellow-cedar is the primary species affected. On average, 65 percent of the basal area of yellow-cedar is dead on declining sites, these high levels are the result of slow intensification of mortality and the long persistence of cedar snags.


Contrasts the persistence of yellow-cedar snags with those of western hemlock and western redcedar.


Reports the recovery of nematodes (Pratylenchus, Aphelenchoides, Sphaeremonema, and Crossonema) from soils around yellow-cedar in southeast Alaska. Although several parasitic taxa were recovered, none was strongly associated with dying trees or dying forests, and nematodes were found in low concentrations.


Evidence from epidemiological studies indicates that management of yellow-cedar will not spread the decline problem to new sites. Recommends studies on the feasibility of salvage.


Argues that yellow-cedar decline is a naturally occurring phenomenon that began in remote locations before 1900. The timing of onset seems to coincide with the end of the so-called Little Ice Age. Possible triggers of yellow-cedar decline, initiated by a changing climate, are discussed.

Summarizes knowledge on the ecology of yellow-cedar, symptoms of declining trees, associated insects and pathogens, bear damage, plant communities affected by decline, age structure of declining stands, mortality spread patterns, cedar reproduction, ecological effects of decline, estimates of decline onset, and the distribution of decline. Discusses the site and abiotic factors associated with decline, presents two hypotheses for the primary cause of decline (freezing damage and soil toxicity), and describes the possible involvement of a warming climate with these hypotheses.


Methods used for dating the onset of decline include the use of 1927 aerial photography, historical records, and two techniques for dating the death of individual yellow-cedar snags. A system for classifying dead yellow-cedars is presented based on the degree of retained foliage, twigs, branches, and the condition of the bole. Estimates are given for time-since-death for each of five snag classes. The fifth class, composed of trees that died an average of 81 yr previously, seems to represent the onset of extensive tree mortality in southeast Alaska.


Reports on a study of symptoms, fungal isolation, and pathogen testing in a search for the cause of yellow-cedar decline. Symptom development in 35 root-excavated trees indicated that death of the fine root system initiates tree decline. Dead coarse roots, necrotic root and stem lesions, and thinning of crowns develop as decline progresses. Over 1,800 attempted isolations were made from symptomatic tissues and led to a number of identified potential pathogens. No isolated fungus showed strong pathogenicity, however. Vesicular-arbuscular mycorrhizae were observed in declining and healthy trees from live root samples. There is no evidence to support a biotic primary cause of yellow-cedar decline.


Discusses a foliar rust pathogen, a shoot blight pathogen, and the decline and mortality problem of yellow-cedar in Alaska.

Reports the sequence of root and aboveground symptoms of declining yellow-cedar trees based on a study involving 40 declining or healthy yellow-cedar trees that were root-excavated. Fungi associated with each symptomatic tissue are discussed. Fungal succession occurs in necrotic lesions on boles of dying trees. A map showing the concentration of mortality from aerial photographs taken in 1927, 1948, 1965, and 1976 of declining sites illustrates the patterns of mortality spread.


Describes the plant communities affected early and late in the development of the decline phenomenon. Decline began in communities on very wet, poorly drained sites and has subsequently spread to adjacent communities on sites with better drainage.


Declining stands have multiple cohort structure and most individual yellow-cedars are from 100 to 450 yr old. Death is not associated with tree age. Since decline onset, an estimated annual mortality rate of this slow-growing species has been 0.5 to 0.7 percent and 0.08 percent in declining and nondeclining stands, respectively. Coupled with negligible regeneration on some sites, decline is markedly altering the yellow-cedar ecosystem.


Chapter on yellow-cedar decline in a book on forest declines. The distribution of decline involving more than 200,000 ha in southeast Alaska is illustrated and discussed. Includes information on tree species affected by decline, the initiation, development, and ecological effects of decline; and biotic and abiotic factors as possible causes of mortality. Small changes in climate, thought to have triggered several forest declines, may have initiated yellow-cedar decline. The long duration and pristine nature of much of the decline distribution suggests that yellow-cedar decline is a natural phenomenon independent of human activity.


Discusses the common diseases of yellow-cedar, including those of seedlings, foliage, stems, roots, and boles.


Briefly describes the occurrence of yellow-cedar at Nootka Sound in British Columbia and near Sitka in Alaska. Mentions specimens with and without cones from several herbaria.


Describes the distribution, habitat, and plant associates of yellow-cedar throughout its range. Gives a detailed distribution map. Includes a plate (plate IX) of a mature yellow-cedar tree at Lituya Bay, Alaska.


Shows the occurrence of yellow-cedar along with mountain hemlock and two fir species in a climax community of the Hudsonian zone of today's flora in the Olympic Peninsula area. Yellow-cedar and western redcedar were not included in pollen analyses of bog communities "because the pollen of these trees not only preserves poorly but is also difficult to identify." The presence of these species may need documentation by macrofossils. The author speculates that yellow-cedar may have survived glaciation in Washington refugia along with mountain hemlock because both thrive at higher elevations where ice-free conditions prevailed.


Reports on the historical abundance of vegetation in Prince William Sound at the northwest limits of the natural range of yellow-cedar by using pollen-profile analysis. Heusser comments that yellow-cedar is currently present at some sampling stations, but the history of this conifer cannot be recounted because of the "absence of recognizable [pollen] grains."

Gives a brief description of yellow-cedar in British Columbia and comments on uses of the wood


Measurements of xylem sap-tension were made during the summer with a pressure chamber on 44 species of herbaceous and woody plants. Yellow-cedar showed seasonally constant or slightly increasing maxima, with minima slowly increasing until there was little diurnal fluctuation. Responses apparently represent alternative adaptations to a seasonally decreasing moisture supply.


Yellow-cedar occurs in the high-elevation boreal forest of the Cascade Range with *Tsuga mertensiana* and *Abies lasiocarpa*, where it typically occupies areas of heavy snowfall and wind-swept ridges. Its distribution is highly disjunct. Yellow-cedar displays relatively little variation in sap tension during drought conditions; measurements were taken from a vegetative clone with many boles that had grown through layering. Seed collected from yellow-cedar did not germinate in any field or in laboratory tests. The author states that yellow-cedar's occurrence is similar to *Menziesia ferruginea* in that it is found in the north Coast Mountains and in the same areas in the high Cascades. The occurrence of yellow-cedar and other species at 37 locations in the Cascades is noted, and a general distribution is displayed on a map.


Characterizes the terrestrial plant communities of typical climax stands. Above the *Abies amabilis*-*Tsuga mertensiana* forest, *T. mertensiana* and *Chamaecyparis nootkatensis* assume dominance, generally at elevations between 4,000 and 5,000 ft. The plant community is described.


Gives a brief description and small illustration of yellow-cedar.

Describes the general appearance, form, bark, and wood of yellow-cedar. Describes and illustrates foliage, flowering, cones, and seeds. Gives elevational limits in Oregon and Washington.

346. Hoffman, B.E. 1913. Alaska woods, their present and prospective uses. Forestry Quarterly. 11(2). 185-200

Uses and characteristics of yellow-cedar wood are described from early in the 20th century. Chief uses are for constructing cabinets and small boats, but yellow-cedar wood is also used for fuel, pencil stock, furniture, and cigar boxes.


An annual publication describing the forest health conditions of Alaska. Includes a map and acreage estimates of yellow-cedar decline, which totals over 1.2 million acres.


Illustrates and briefly describes several insects and diseases of yellow-cedar in Alaska.

349. Holubcik, M. 1960. Prispevok kotazke pestovania cudzokra nych drevin v nasich porastoch. Raising exotics in Czechoslovak stands. Lesnicky Casopis. 6(1). 64-75

Gives a brief discussion on experience with growing 14 conifers including *Chamaecyparis nootkatensis* and a few broad-leaved species.

350. Hooker, William Jackson. 1840. Flora Boreali-americana, or, the botany of the northern parts of British America, compiled principally from the plants collected by Dr. Richardson & Mr. Drummond on the late northern expeditions, under command of Captain Sir John Franklin, R N to which are added those of Mr. Douglas, from North-west America, and of other naturalists. London. Henry G Bohn. Vol II

Lists yellow-cedar as "*Cupressus Nutkatensis* Lamb." on page 165. Gives a short description and indicates that the natural distribution is along the northwest coast of North America. Notes occurrences at Observatory Inlet (probably located north of Prince Rupert, BC) and at Sitka. Hooker may have examined Bongard's (1833) specimen because he indicates that it is the same species as described here. He also compares yellow-cedar to Atlantic white-cedar, which he refers to as *Cupressus thyoides*. 

Describes the form, habit, size, foliage, cones, bark, wood, and uses of yellow-cedar. Includes a distribution map for British Columbia.


Gives a brief description of yellow-cedar.


Lists yellow-cedar with other plant species that are distinctly oceanic plants and extend from Washington and California to southeast Alaska.


Provides a number of early citations on the occurrence of yellow-cedar in Alaska. Gives a brief description of the tree. Mentions that the type for a synonym, Thuja excelsa, was taken in Sitka.


Gives a brief description, an illustration, and location occurrences in Alaska for yellow-cedar.


The wood of yellow-cedar had less weight loss (i.e., decay) than all but one tree species in a wood-inoculation study involving 75 tree species and the fungus Pona mcrassata, the cause of wood decay of forest products.


Damage to cones of yellow-cedar caused by a mite (Trisetacus n sp) is described in British Columbia.

The susceptibility of several Chamaecyparis species to the fungal root pathogens Phytophthora spp., including P. lateralis was tested. Yellow-cedar and the hybrid Leyland cypress did not show any symptoms of disease in inoculation tests. In grafting trials performed to determine if Port-Orford-cedar scion material was compatible with rootstocks of other Chamaecyparis spp., 7 of 378 grafts survived 1 yr and only one graft survived 2 yr on yellow-cedar rootstock.


Describes forest conditions in Alaska. Minimum stumpage rate for yellow-cedar from the Tongass Forest is $1.50 per thousand board feet. A few yellow-cedar logs have been shipped to Japan, but receipts did not justify continuing export.


As of 1955, the inventory of mature yellow-cedar in mature stands in British Columbia was 1,560,123 ft³. Annual cut of yellow-cedar for all timber products was 3,336 ft³.


In Alaska, the volume of yellow-cedar and western redcedar is about 4 billion board feet each. There is no active market for either species today. A photo of a tree 4 ft in diameter is shown on page 46.


363. Ishibashi, Sadaki; Guzuguchi, Takefumi; Matsuwaki, Masahiro, inventors; Japan Kokai Tokkyo Koho, assignee. 1992. Cedar oil-containing miticides for domestic use. JP patent 9213607 A2; JP patent 0413607. January 17. 4 p A01N-065/00A; A01N-025/08B; A01N-025/12B; A01N-025/18B. In Japanese.

A patent for the use of an extract from yellow-cedar foliage as a miticide.


Methods for determining the conformation of nootkatone from the heartwood of yellow-cedar are described.

Describes the occurrence of a chance hybrid between yellow-cedar and Monterey cypress. The authors propose the name "Cupressus Leylandii."


Chamae- (Greek) in botany sometimes signifies false and Cyparis- (Kypanssos in Greek) means cypress. Hence, the generic name Chamaecyparis, or false cypress. (Note Chamae- also means ground or low in Greek).


Mentions yellow-cedar as one of the coastal tree species occurring in the Puget Sound area. The author argues that Puget Sound, Sierra Nevada, and Mexican highlands are the centers of important areas of endemism for tree species of western North America.


Gas-liquid chromatography was used to separate nootkatin, a component of yellow-cedar heartwood, from other tropolones. Indicates that tropolones, such as nootkatin, are some of the most powerful natural fungicides.


Describes the ornamental forms of yellow-cedar used in gardens under the name "Nootka cypress."


374. **Jozsa, L.A. 1991.** Yellow cypress trivia

Mentions some of the oldest known trees including yellow-cedar in Canada and elsewhere Also describes the growth of very slow growing trees

375. **Jozsa, L.A. 1991.** Yellow cypress wood quality and the hinoki connection

Reports on wood characteristics of yellow-cedar comparing a plantation grown tree (16 yr old), an older young-growth tree (100 yr old), and an old-growth tree An X ray densiometer technique was used to measure within-ring wood density Yellow-cedar has much less variation in wood density between early and late wood than other conifers, it is the most homogeneous commercial softwood in Canada Preliminary results indicated that density uniformity is maintained in young trees In addition, the average density from young trees was 0.43 g/cm³, not far below that tested from the old-growth tree and similar to the published value for old-growth wood These results are compared with tests on hinoki cedar (*Chamaecyparis obtusa*)

In Diversity of Pacific Basin woods in past, present and future proceedings of a symposium, 1992 Aug 14-16, Lawau, HI International Association of Wood Association Bulletin 13(3) 244-245


378. **Kamm William G., Kohn, Hubert E. 1980.** Effect of warm temperature treatments on freezing tolerance and relative water content of some conifers
[Abstract] Cryobiology 17(6) 625

Freezing tolerance was tested throughout more than a 1 yr cycle for yellow cedar and three other coniferous species on Mount Baker, Washington Warm treatments (10-20 °C for 18 hr) resulted in rapid loss of freezing tolerance for all tree species, except that the 10- and 15-°C treatments retained freezing tolerance in mid and late winter No significant association was found between freezing tolerance and water content for yellow-cedar

379. **Kanouse, B.B.; Smith, A.H. 1940.** Two new genera of Discomycetes from the Olympic National Forest
Mycologia 32 756-759

A new genus and species are described for *Gelatinodiscus flavidus*, a fungus that invades the foliage and twigs of yellow-cedar in the Olympic Mountains

Yellow-cedar was not a preferred food for the eastern subterranean termite but received damage when it was the only available food in no-choice tests. Mats made of wood fiber of yellow-cedar or western hemlock pressed with waxes and resins experienced no feeding.

381. Karlsson, Bengt; Pilotti, Anne-Marie; Wiehager, Anne-Charlotte. 1973. The crystal structure of chanootin, a bi-cyclic 15 carbon tropolone Acta Crystallographica Section B, Structural Crystallography and Crystal Chemistry 29(6) 1209-1213

Determines the structure of chanootin, a bicyclic tropolone isolated from the heartwood of yellow-cedar.


The growth and survival of rooted cuttings and seedlings of yellow-cedar were measured in two separate trials 2 or 4 yr after outplanting in British Columbia. Survival was high and growth was similar for seedlings and rooted cuttings. A description is given for the establishment of a hedging orchard for the production of rooted cuttings for reforestation.


The production of regeneration stock from rooted cuttings of yellow-cedar is described.


Yellow-cedar trees that resulted from rooted cuttings and seedlings were compared for survival and growth 9 and 11 yr after planting in British Columbia. Survival was high (98 percent) after 11 yr, with no significant difference by planting stock origin. Trees that originated from rooted cuttings from the oldest (7 yr-old) material produced more multiple leaders than trees originating rooted from younger sources or from seedlings. In a second study, there was a significantly greater incidence of trees with multiple leaders from seedlings than from rooted cuttings (from 2-yr-old donor material) but no differences in height and diameter growth.

According to the authors, the approved common name for *Chamaecyparis nootkatensis* is "Nootka falsecypress." The following clones are recognized, blue (*glauca*), compact (*compacta*), Sanders (*sanden*), silver (*argenteovariegata*), weeping (*pendula*), and yellowleaf (*lutea*).


Foliar litterfall nutrient concentrations were analyzed for several tree species of the Pacific Northwest, including yellow-cedar, at two arboreta. Yellow-cedar was noteworthy in having higher concentrations of calcium in its newly discarded foliage than any other tree species.

388. **King, R. Dennis; Bendell, James F. 1982.** Foods selected by blue grouse (*Dendragapus obscurus fuliginosus*). Canadian Journal of Zoology. 60: 3268-3281

Reports on a study of the diet of blue grouse on Vancouver Island. Adult males consumed the foliage of some conifers but rejected yellow-cedar foliage when it was offered.


On both Woronkofski and Coronation Islands, Alaska, yellow-cedar is often present as a subordinate tree in the old-growth stands; but in blow-down areas and muskeg edges on Coronation Island and in an old burn on Woronkofski Island, it is frequently a dominant species or codominant with western hemlock and Sitka spruce. In open scrub forests on poorly drained sites, lodgepole pine is usually the dominant tree form, although it is frequently replaced by yellow-cedar on Coronation Island. Trees are dwarfed, commonly not over 20-30 ft tall, and widely spaced.

Lists yellow-cedar in the coastal western hemlock and mountain hemlock bioclimatic zones of British Columbia. Indicates that yellow-cedar develops best on moist and medium or rich soils, is moderately shade tolerant, is frost intolerant, is heavy snow cover tolerant, and is an indicator of maritime wet and snowy climates. Describes the sites where yellow-cedar is suitable for planting. Mentions that low spatial crown requirements contribute to high timber yields.


The occurrence of yellow-cedar is an indicator of hypermaritime to submantine, subalpine boreal, and cool to cold mesothermal climates in British Columbia. Yellow-cedar can tolerate a range of soil conditions. It is common on seepage-affected colluvial slopes. It is most productive on moist, nutrient-rich sites with a wet, cool mesothermal climate.


Yellow-cedar sometimes is dominant but more frequently is scattered in various ecosystems in the mountain hemlock zone and in the wetter coastal western hemlock zones in British Columbia. In general, it is adapted to very humid (rainy and snowy) climates with relatively warm winters and cool summers and has a wide edaphic range.


Tested different stratification regimes to improve the germination of yellow-cedar seed. Warm preconditioning, maintaining high moisture during stratification, and extending cold treatment were the most important components for good germination rates.
396. Konishi, C; Yamaguchi, K. 1978. Sawing properties of timbers sawn with a band saw Mokuzai Kogyo (Wood Industry) 33(2) 19-21


These annual reports provide detailed biological and physical information on sites where yellow-cedar is a component of plant communities in British Columbia. Lists the occurrence of yellow-cedar in the region (Pacific coastal subalpine forest), zone (mountain hemlock), and vegetation cover (subalpine coniferous forest). The prevailing pedogenic process for this zone is strong podzolization, strong mor formation (raw humus with a high concentration of organic material), and strong gleization (reduction process). Soils are classified in the subalpine humic (hums) podzol group and humus is described as ligno-mycelial mor. Associated vegetation, elevational limits, and climatic data for the zone are given.


Coniferous trees growing in the Pacific Northwest are listed by lower and subalpine altitudes according to their increasing shade tolerance. In subalpine altitudes, Chamaecyparis nootkatensis is moderately shade tolerant but two of its associates, Tsuga mertensiana and Abies amabilis, possess extreme shade tolerance. British Columbia is divided into seven biogeoclimatic regions (formations) and several zones. Yellow cedar is one of the plant indicator species present in the Pacific coastal subalpine forest region in the mountain hemlock zone.

399. Krajina, V.J., ed. 1965. Ecology of western North America Vancouver University of British Columbia, Department of Biology and Botany 112 p Vol 1


Describes the biogeoclimatic zones for yellow-cedar in British Columbia and gives details of its natural habitat and site requirements.


Provides a map of the distribution of yellow-cedar in British Columbia. Indicates climatic, physiographic, and edaphic requirements of sites suitable for growth. Suggests that frost resistance is low unless soils are well covered by a heavy accumulation of snow. Shade and flooding tolerance are listed as high. Base-rich substrata (e.g., calcium and magnesium) favor the occurrence of yellow-cedar over that of mountain hemlock.

402. Krajina, Vladimir J. 1959. Bioclimatic zones in British Columbia. Ser 1 Vancouver University of British Columbia, Department of Biology and Botany 47 p
Yellow-cedar, found singly near Sitka, has a splendid wood for carving. The strong aromatic odor is supposed to be protection against moths and other harmful insects. For this quality, it was highly prized in China where it was formerly imported and made into trunks by the Chinese under the name "camphor wood." The shipworm, the teredo, supposedly does not feed on yellow-cedar. Uses of the tree by Tlingit people are also described, including making woven hats from the roots.

Notes on 16 forms of *Thuja* and 18 species and forms of *Chamaecyparis*

Lists yellow-cedar collected in southeast Alaska at Kasaan Bay, Prince of Wales Island, and at Wrangell during an expedition in 1882

411. **Labeke, M.C. van; Vanwezer, J. 1989.** Groeikrachtvergelijking by koniferen, vermenigvuldigd door stekken of enten. Comparison of the vigour of conifers propagated by cuttings or grafting. Verbondsnieuws voor de Belgische Sierteelt 33(8) 375, 377, 379


This book contains the original botanical description for yellow-cedar under the scientific name *Cupressus Nootkatensis*. The actual description is apparently written by David Don. In the book’s preface, Lambert states, “I have here to acknowledge my obligations to Mr Don, for the pains he has taken forming the Descriptions, and the accurate manner in which the whole has been executed”.

There has been confusion among botanists and others regarding the appropriate authority for the species, i.e., *C. nootkatensis* D Don, or *C. nootkatensis* Lamb (see Don 1824). The common name listed is “Nootka cypress” and Menzies is mentioned as the collector of the specimen.

413. **Langille, H.D.; Plummer, Fred G.; Dodwell, Arthur [and others]. 1903.** Forest conditions in the Cascade Range Forest Reserve. Surv Prof Pap 9, Series H, Forest 6 Washington, DC U.S. Geologic Survey 298 p

Forest conditions in the Cascade Range Forest Reserve are described by township. Yellow-cedar was found in 14 townships within the reserve, but in only two were the trees large and numerous enough to be included in timber estimates. Mature trees are 1.5 ft in diameter and 45 ft tall, with 12 ft of clear trunk.

414. **Laroque, C.P. 1995.** The dendrochronology and dendrochmatology of yellow-cedar on Vancouver Island, British Columbia. Victoria, BC University of Victoria 133 p MS thesis

Yellow-cedar was found to be sensitive to climatic fluctuations in a study of 380 increment cores taken from trees between latitude 50° and 51° N on Vancouver Island. Temperatures during August of the previous year had the greatest influence on ring width.

415. **Laurent, T.H. 1974.** The forest ecosystem of southeast Alaska. 6 Forest diseases. Gen Tech Rep PNW-23 Portland, OR U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station 30 p

Refers to early reports of the high levels of heart rot in the two cedars of Alaska, western redcedar and yellow-cedar. Early reports combine the two species and describe two prominent heart rot fungi that cause most of the defect. The author suggests that little is known about the diseases of yellow-cedar throughout its range.

Reports on a study of plant succession in an old-growth forest experiencing small-scale (gap-phase) disturbance in British Columbia. Yellow-cedar fills in gaps when they are caused by the death of either mountain hemlock or another yellow-cedar. Gap size does not appear to influence yellow-cedar’s success of filling in, but success is usually greatest on benches that form cold air drainages and maintain late spring snowpack. Pacific silver fir is the predominant gap-filler species throughout the study area. As a tree with great longevity, yellow-cedar may exhibit the "storage effect," whereby long-lived individuals persist through periods unfavorable for recruitment and serve as a source of recruits when better times return.


Population dynamics and regeneration of amabilis fir, yellow-cedar, and two hemlock species were studied in old-growth forests in British Columbia maintained by gap-phase disturbance. Annual mortality rates for yellow-cedar used in four models ranged from 0.0009 to 0.0084 (0.09 to 0.84 percent). Yellow-cedar comprised only 2 percent of the gapmakers (large, killed trees) but 4.5 percent of the gap-fillers. Several yellow-cedars were aged over 1100 yr. In three climate models, yellow-cedar is the most successful in a cooler climate and filled in more gaps where the death of a yellow-cedar initiated the gap. Yellow-cedar may be able to maintain its part in the species composition of these forests during unfavorable periods of regeneration (e.g., due to a warmer climate) because of its low mortality rate and great longevity.

418. **Lertzman, Kenneth P.; Sutherland, Glenn D.; Inselberg, Alex; Sanders, Sari C. 1996.** Canopy gaps and the landscape mosaic in a coastal temperate rain forest. Ecology. 77: 1254-1270.

An analysis of small-scale disturbance and tree mortality in forests on the west coast of Vancouver Island. Yellow-cedar was a component of the forests studied.


The author formally describes a new species of *Chamaecyparis*, *C. henryae* sp. nov., from the Southeastern United States. It is distinguished from northern and mid-Atlantic forms of *C. thyoides* by having flatter, lighter green foliage, smoother bark, and flowers of a different color. The author comments that the newly described taxon more closely resembles yellow-cedar than *C. thyoides*. 

Lists yellow-cedar as occurring in the Eddy Arboretum.


Gives a brief description of yellow-cedar and illustrates foliage and a cone.


Lists common names and mentions the range of yellow-cedar. Suggests that Alaska-cedar is the accepted U.S. common name.


Primarily a treatment of Cupressus species of North America, the author briefly discusses genera concepts for Cupressus and Chamaecyparis. A conservative approach to Cupressus is outlined, which includes eight species in North America north of Mexico, and the genus Chamaecyparis is apparently maintained.


Gives a map of the natural range of yellow-cedar.


Gives common names, a brief description, and uses for yellow-cedar wood.


The hormone gibberellic acid (GA₃) was injected into trees of 33 species of Cupressaceae and Taxodiaceae by using a microsyringe. Yellow-cedar and the Leyland cypress hybrid were among tree species that showed the most responsive influence of hormone treatment with a pronounced increase in the number of male and female cones produced.

Proceedings from a meeting on yellow-cedar biology and management. Contains short papers on ecology, wood properties, products, physiology, genetics, and pests.


Lists a number of fungi known to occur on yellow-cedar, including each of its varieties.


Yellow-cedar has not been planted extensively as a forest tree in Britain, because its growth is slow and it often forks badly. It hybridizes with *Cupressus macrocarpa*, however, to produce *Cupressocyparis leylandii*. This hybrid is apparently more frost resistant than either of its parents and shows remarkable vigor.


The nootka cypress, discovered by Archibald Menzies in 1793 and introduced into Great Britain in 1853, has been planted as a specimen tree and ornamental in most parts of Britain and has succeeded. A number of examples are given. The tree does not seem to be greatly affected by late spring frosts and is able to withstand exposure. It is slow growing, however, and is damaged by deer. The seeds require stratification for up to a year before sowing.


Briefly mentions the occurrence of yellow-cedar in British Columbia under the name *Thuja exelsa* Bongard.


Gives information on the inventory, log grades, and value of yellow-cedar in British Columbia and fluctuations in the market.


Tables include data on specific gravity, shrinkage, and composite strength values of many hardwoods and softwoods, including yellow-cedar


Strength of various woods for aircraft design is given, and factors affecting these values are discussed. Yellow-cedar may be considered with red, white, and Sitka spruce for use in highly stressed parts, such as wing beams


Gives information of the range, distribution, supply, properties, and uses of yellow-cedar, and a general description of the tree. The total stand is estimated to be about 10 billion board feet, with about 2.5 billion board feet in Alaska.


Describes the important characteristics of many woods for aircraft construction, including yellow-cedar. Yellow-cedar is not likely to be considered for use in aircraft because of its limited supply. It may serve as a species supplementary to spruce in some applications, the result being somewhat greater strength at the expense of increased weight.


Lists mechanical properties of yellow-cedar.

Describes the occurrence of yellow-cedar in different plant associations, with the most detail in the section on the western hemlock-yellowcedar series. Includes silvicultural information for yellow-cedar, including ideas on maximizing natural regeneration.


Discusses the occurrence of yellow-cedar in plant associations of northern end of the Alexander Archipelago in Alaska.


Reports on the synthesis of two compounds from Juniperus rigida. One of the compounds, gamma acoradiene, is identical to alpha alaskene, which has been isolated from yellow-cedar. Delta acoradiene, the other compound, is enantiomeric to beta alaskene, also from yellow-cedar.


Yellow-cedar was collected in 1939 on the northeast slope of Mount Emily in northwestern Siskiyou County and was reportedly seen on Little Grayback, farther to the west. Both localities are a little over 2 mi from the Oregon border. Specimens of the Mount Emily material are deposited in the herbarium at Rancho Santa Ana Botanic Garden, Anaheim, California. Trees associated with yellow-cedar are Abies shastensis (Abies magnifica var. shastensis), Picea breweriana, Pinus monticola, Libocedrus decurrens, and Taxus brevifolia.


Reports soil aeration as a key component to successful rooting of cuttings for the hybrid Leyland cypress.


The historical abundance of vegetation in southwestern British Columbia near Vancouver is described from analyses of pollen profiles, macrofossils, and radiocarbon dating. Cedar pollen became common at two sites about 6600 yr BP and then, in the most recent 500 yr, decreased. Fire probably played a role in the decreased abundance of cedar. At its peak, cedar accounted for 68 percent of the pollen at one site. The author states that a major deficiency in all previously published pollen diagrams from the Pacific Northwest is the lack of data on pollen of the Cupressaceae. Pollen appeared to preserve well in peat deposits despite Heusser’s (1960) comments that it generally does not. The majority of the cedar pollen found in this study, especially at one site, was assumed to be from western redcedar, because it is currently more common than yellow-cedar.

451. Mayr, Heinrich. 1890. Die Waldungen von Nordamerika ihre Holzarten, deren Anbaufahigkeit und forstlicher Werth fur Europa im Allgemeinen und Deutschland insbensonder. The forests of North America, their tree species, their cultivation possibilities, and general forest values for Europe. Munchen University Buchhandlung 448 p


Yellow-cedar was found at only one location in the region on a mountain along the north border at the west end of the valley.


Gives a brief description of the appearance and uses of yellow-cedar wood.

454. McGugan, B.M. 1958. Forest Lepidoptera of Canada, recorded by the forest insect survey Vol 1 Papilionidae to Arctiidae. Publ 1034 [Place of publication unknown] Canada Department of Agriculture, Forest Biology Division 76 p


Fossil specimens of foliage and seed cones are compared to the morphology of yellow-cedar.


Fossil remains of foliage and seed cones found on Vancouver Island from the Cretaceous period are presumed to represent an extant Chamaecyparis species, C corpulenta. The fossil foliage is more similar to yellow-cedar and Thuja spp.
than to other living members of the *Chamaecyparis*. Seed cones are distinctly unlike *Thuja* and are more comparable to *Chamaecyparis*, especially yellow-cedar, except that the fossil’s cones are much smaller. The fossil may represent an ancestral form of *Chamaecyparis*.


Fossil evidence may assist in understanding the origins and evolution of taxa in the Cupressaceae. Well-preserved fossils from the Late Cretaceous sediments found in Alberta Canada are studied. A new extant species is described and contrasted with living taxa of Cupressaceae, especially yellow-cedar.


Gives a brief description of yellow-cedar and a key to five species of the genus.


A letter written by Mertens is published by Hooker. Mertens describes yellow-cedar and other vegetation along a transect from tidewater to Mount Verstovia near Sitka. Mertens apparently made the collections of yellow-cedar that Bongard used in describing it as a new species under the name *Thuja excesla* Bong.


A report of yellow-cedar trees 3 ft in diameter on benches in the vicinity of Lituya Bay.


Forest statistics are given for the following counties: Clackamas, Clatsop, Columbia, Hood River, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill. On commercial forest land, the volume of yellow-cedar growing stock 5 0 in in diameter at breast height (d b h ) and larger was 5 million ft³ Volume of yellow-cedar sawtimber 11 0 in d b h and larger was 10 million board feet (Scribner).

Yellow-cedar and a number of other conifer species are compared for numerous characteristics on the basis of published literature and observations. These include shade tolerance to various environmental factors, growth, reproduction, physical characteristics, and insect and disease resistance.


Formally describes two new hybrids from Great Britain. *Cupressocyparis notabilis* Mitchell, with parents yellow-cedar and *Cupressus glabra* from Alice Holt Lodge, Hampshire, and *Cupressocyparis ovensii* Mitchell with parents yellow-cedar and *Cupressus lusitanica* from Silk Wood, Gloucestershire.


Describes the process of collecting bark by Native people that produces "culturally modified trees," including those of yellow-cedar. These trees have been found along the Pacific Coast of Alaska and British Columbia and also in the Cascade Range of Washington. The study of culturally modified trees, which often includes dating the wounding event, can produce valuable anthropological information.


Gives a description and the range of yellow-cedar in Canada.


A catalog of plant collections made by the author. Lists seven locations where specimens of yellow-cedar were collected in Washington. In Whatcom County, yellow-cedar is locally common in cool, moist mountain valleys, sometimes forming clumps of trees in alpine meadows.
469. **Muir, John. 1897.** The forests of Alaska The Forester Nov 129-130

Describes yellow-cedar, its size, the wood, and uses by native people. The author found that the wood of downed yellow-cedar trees on the forest floor supporting 200- or 300-yr-old trees "is as fresh in the heart as when it fell." Uses of the yellow-cedar tree by Native people are mentioned.


Describes the appearance and size of yellow-cedar trees during several explorations of southeast Alaska. States that nearly every yellow-cedar tree in one area had bole scars from Tlinkit people making bark collections. The bark has a number of uses. Sheets of bark were often carried in canoes for the quick construction of camping huts.

471. **Muir, N. 1978.** Ornamental conifers Gardeners Chronicle, the Horticulture Trade Journal (GC and HTJ) 183(15) 14-16

472. **Mulholland, F.D. 1937.** The forest resources of British Columbia Victoria, BC British Columbia Forest Service, Department of Lands 153 p

Total merchantable timber and accessible merchantable timber by forest district are given. Yellow-cedar volume is shown in the Vancouver and Prince Rupert district. Total merchantable volume is 3,019,200,000 board feet, of which 1,398,300,000 board feet is accessible.

473. **Munday, Don. 1931.** Ancients of the sky lines Canada Forestry and Outdoors 27(11) 25-27

A general discourse on yellow-cedar, its appearance, habitat, growth rate, stature, and longevity. The largest trees seen by the author were 19-1/2 and 20-1/2 ft in circumference and were estimated to be at least 3500 yr old.

474. **Munns, E.N. 1938.** The distribution of important forest trees of the United States Misc Publ 287 Washington, DC US Department of Agriculture 176 p

Contains a range map of yellow-cedar on page 60.

475. **Munz, Philip A. 1959.** A California flora Berkeley, CA University of California Press 1681 p

 Gives a brief description of yellow-cedar and mentions two occurrences in California.
476. munz, philip a.; keck, david d. 1968. a california flora Berkeley, CA University of California Press 1681 p

Indicates that yellow-cedar differs from Port-Orford-cedar by having less flattened branchlets, thinner bark, less glandular and more blue-green foliage. Gives two locations of occurrence in California.

477. Neiland, B.J. 1971. The forest-bog complex of southeast Alaska Vegetatio 22 1-64

Gives a detailed description of the occurrence of yellow-cedar in plant communities in bogs and adjacent forests of southeast Alaska. Yellow-cedar is conspicuous in the "intermediate" forest (ecotone between well-drained forest and bog).


Fibreboards were made and tested for their contrasting properties and lignin content from eight tree species, including yellow-cedar.


480. Norin, Torbjorn. 1964. Chanootin, a bicyclic C_{15}-tropolone from the heartwood of Chamaecyparis nootkatensis (Lamb.) Spach Arkiv for Kemi (Stockholm) 22 129-135

A new C_{15}-tropolone, C_{15}H_{18}O_{3}, has been isolated from the heartwood of Chamaecyparis nootkatensis for which the name "chanootin" is proposed.

481. Norin, Torbjorn. 1964. The chemistry of the natural order Cupressales Part 50 The absolute configurations of chamic, chaminic, and isoachamic acids Arkiv for Kemi (Stockholm) 22 123-128

Describes the absolute configuration of three chemical substances found in the heartwood of yellow-cedar.

482. Norin, Torbjorn; Stromberg, Sture; Weber, Michael. 1982. Conformation of the bicyclo 4 1 0 hept-2-ene system configuration and conformation of chamic-acid (trans-car-4-ene-10-oic acid) Chemica Scripta 20 49-52

The transisomeric configuration of chamic acid, a heartwood constituent, is determined. Evidence is also presented on the probable planar chairlike conformation of chamic acid.

Describes the synthesis of nootkatone, an eremophilanoid sesquiterpene that occurs in yellow-cedar heartwood and grapefruit oil.


The effect of grain size on wear rate is reported from an abrasion study on several tree species, including yellow-cedar.


Reports on a study that compares sculptured patterns of the inner foliage cuticles of the Leyland cypress hybrid with its parent species, Monterey cypress and yellow-cedar. The hybrid shows intermediate patterns of several but not all features.


Contains tables and regression coefficients for estimating breast height diameters from stump measurements and for calculating stump radius inside bark at desired stump heights. Results for yellow-cedar are in table 17.


The author presents an ecosystem classification of the forest stands of the coastal western hemlock zone. Yellow-cedar is shown to be an inhabitant of the dry edaphic and mesic zonal forest types of the wet and cool subzone. Yellow-cedar is included in a number of forest types.


Yellow-cedar is listed as occurring in a class of "very wet" sites in an analysis of the effects of soil moisture on vegetation in British Columbia.
489. Orloci, Laszlo. 1964. Vegetational and environmental variations in the ecosystems of the coastal western hemlock zone. Vancouver University of British Columbia, Department of Biology and Botany 204 p Ph D dissertation


Yellow-cedar is tabulated with its plant associates in the Gaultherieto-Tsugetum heterophyllae association under two ecosystem types, Orthic Vaccinium-Gaultheria type, and Lithosolic Vaccinium-Gaultheria type. Characteristic landform, slope, altitude, and soil characteristics of the habitats are tabulated. Associated tree species on both types are western hemlock, western redcedar, Douglas-fir, and western white pine.


Describes natural hybrid between Cupressus macrocarpa and Chamaecyparis nootkatensis. The hybrid proved much hardier than C macrocarpa in the great frost of January 1940. It is easy to propagate from cuttings and has been raised from seed.


Indicates that yellow-cedar is rare in some areas of the Queen Charlotte Islands, but is common at high elevations, and can be found on the northern part of Moresby Island, Cumshewa Inlet, at the heads of Rose Harbor and West Arm, and near Massett. Yellow-cedar grows with mountain hemlock in the Hudsonian zone.


Outlines the timing of flower, cone, and seed development for yellow-cedar. Describes the appearance of immature and mature cones. Based on seven trees sampled, reports that cones averaged 7.2 seeds/cone and a high percentage (71 percent) of unfilled seeds.


A morphological study was conducted to increase the understanding of reproduction in yellow-cedar. Male flower, female flower, fertilization, embryo, and seed development are described in detail. Microscopic and macroscopic descriptions and illustrations are given. The timing (phenology) of each process is indicated.

Provides some general information on the range and growth of yellow-cedar, then gives valuable details on reproductive development from cone initiation through seed dispersal. Includes line drawings, photographs, and scanning electron micrographs.


Short manual with color photographs showing the appearance of first- and second-yr cones and seeds. Mentions that cone and seed collection in British Columbia should occur in September and October. Designed for those interested in collecting seed for reforestation.


Pollen cones were initiated on proximal vegetative shoots during 3 wk from mid-June to early July on Vancouver Island. Transition to a pollen-cone apex was marked by the formation of a lateral branch in the last-formed leaf primordium. Meiosis occurred in August. Seed cones were initiated on newly formed, distal axillary vegetative shoots during 3 wk from late June to mid-July. Seed cone development was complete by early September. Details and illustrations of the various structures involved in reproduction are given.

498. Owens, John N.; Molder, Marje 1977. Cone induction in yellow cypress (Chamaecyparis nootkatensis) by gibberellin A₃, and the subsequent development of seeds within the induced cones. Canadian Journal of Forest Research. 7: 605-613

The plant hormone gibberelhin A₃ was applied by foliar spray to yellow-cedar seedlings to determine if this treatment could enhance cone and seed production. Treatments enhanced both pollen and seed cone development by the transition of vegetative apices into reproductive apices. Female cones produced with this treatment yielded a high percentage of filled, viable seed.


Mature one-celled pollen is produced before pollen cones become dormant in fall. The size and microscopic appearance of pollen is given. Pollen is shed in the one- or two-celled stage during the following March. Ovules are flask shaped and form before seed-cone dormancy. Seed cones enlarge and open in March, exposing the ovules. The pollination process is described.


Describes the appearance, properties, and anatomy of yellow-cedar wood
Includes two microscopic illustrations Lists uses of the wood


Provides a description and information on the life cycle of the foliar rust of yellow-cedar, *Gymnosporangium nootkatense* Alternate hosts are *Malus fusca, M diversifolia,* and *Sorbus sitchensis* Includes a map of the known distribution of the rust fungus


504. **Paul, B.H. 1961.** Choose the right wood properties and uses of some minor western softwoods Hitchcock's Woodworking Digest 63(10) 26-27

Tabulates and briefly discusses the sources, supply, physical and mechanical properties, and uses of yellow-cedar and several other western conifers

505. **Paul, Benson H. 1959.** The effect of environmental factors on wood quality Report 2170 [Place of publication unknown] U S Department of Agriculture, Forest Service Forest Products Laboratory 48 p

The western cedars, including yellow-cedar, commonly have highly durable heartwood Yellow-cedar has a specific gravity of 0.42, higher than other cedars, with growth rates generally 10 and mostly around 20 rings per in This slow growth is desirable for certain specialty uses, which require uniform structure

506. **Pawuk, William H. 1993.** Germination of Alaska-cedar seed Tree Planters’ Notes 44(1) 21-24

Seeds of yellow-cedar were tested for germination following different combinations of warm and cold treatments A stratification of 60 d warm followed by 90 d of cold is recommended

After treatment, yellow-cedar wood was found to be suitable for use as battery separators. Tests after treatments are described.


Describes the appearance, growth, form, and current and historic uses of yellow-cedar.


Yellow-cedar is described and mentioned briefly under minor species. The tree occurs between the 2,500- and 7,000-ft elevations in Oregon.


Discusses taxonomic concepts for Cupressus, Chamaecypans, and other genera. The author places importance on the morphology of ray cells and recommends ignoring the genus Chamaecypans and placing these species in Cupressus. This move would restore yellow-cedar to its original scientific name, Cupressus nootkatensis D. Don. The author also points out that Port-Orford-cedar, Atlantic white-cedar, and yellow-cedar are all distinguishable from Cupressus species by the former group having small, narrowly lenticular pits in tangential walls of summerwood tracheids. The author also discusses two subgenus designations for Cupressus, including one for species now residing in Chamaecypans and the other for those already placed in Cupressus.


Gives a microscopic description of yellow-cedar wood complete with cell dimensions. Comments that the structure of summerwood is quite variable. Gives some wood strength measurements. Lists the tree as a species of Cupressus under the name “Cupressus nootkatensis Lam.”
513. Perry, R.S. 1939. Yellow cedar (Chamaecyparis nootkatensis) [Lamb ] Spach its characteristics, properties and uses British Columbia Lumberman 23 30-31

The natural range of the species is the Pacific Coast of North America from southern Alaska to northern Oregon. The total estimated stand is about 6 billion board feet, half of which is found on the west side of the coast mountains in British Columbia. It usually grows in mixtures with Sitka spruce, western hemlock fir, or western redcedar. It averages 85 ft tall and 3 ft in diameter. It is a slow-growing species and is susceptible to heart rot, which makes it difficult to obtain large amounts of high-grade lumber. The wood is clear, yellow, straight grained, light in weight, and of average strength and toughness, has a low shrinkage factor, and is of high durability. Many of its uses are listed. The strength properties of this and other western commercial species are tabulated.

514. Perry, R.S. 1954. Yellow cedar its characteristics, properties, and uses For Br Bull 114 Ottawa Canadian Department of Northern Affairs and Natural Resources 19 p

A comprehensive discussion of yellow-cedar with emphasis on the tree in British Columbia. Nomenclature, locality, supply, silvical characteristics, wood characteristics, seasoning, workability, finishing, durability, marketing, and uses are discussed and strength properties tabulated.


Indicates that yellow-cedar is considered one of the most valuable trees on the Pacific Coast. Briefly describes characteristics of its wood. Yellow-cedar is called 'dushnik' (meaning scented wood) by Russians, who the author states, nearly exterminated the tree in the vicinity of Sitka.


519. Piper, Charles V.; Beattie, R. Kent. 1915. Flora of the Northwest coast, including the area west of the summit of the Cascade mountains from the 49th parallel south to the Calapooya Mountains on the south border of Lane County, Oregon Lancaster, PA New Era Printing Co 418 p


The development of white, or chlorophyll-deficient foliage, is explained by anatomical observation.


Describes the appearance of yellow-cedar, gives a distribution map, and mentions uses by Native people.

524. Pomeroy, Kenneth B.; Dixon, Dorothy. 1966. These are the champs American Forests. 72(5). 14-35.

The largest reported yellow-cedar tree in the United States is reported to be in Mount Rainier National Park, Washington. It is 25 ft 6 in in circumference, 134 ft tall, and has a 25-ft crown spread.


Gives a key to the genus and general description, range, and silvical characteristics of yellow-cedar.


Yellow-cedar rooted cuttings (stecklings) were acclimated to several photoperiod and temperature combinations, deacclimated to a common environment, and measured for morphology, photosynthesis, and other physiological processes during both steps. Shoot growth was reduced more by short photoperiods than by cool temperatures, as were net photosynthesis, stomatal conductance, transpiration, and photosynthetic efficiency. Photoperiod-induced cold hardiness was reversible by warm treatments (i.e., 20 °C, 12-hr/d photoperiod)


Lists the rust fungus, Gymnosporangium nootkatense, on yellow-cedar in the United States. Yellow-cedar is the telial host for the fungus, Sorbus spp and Malus rivularis are hosts for the aecial stage. The fungus causes pustules and galls of leaves and tender shoots but is of little or no economic importance. Herpotrichia nigra and Phomopsis juniperovora are both listed as occurring on Chamaecypars species.

532 Record, Samuel J. 1919. Identification of the economic woods of the United States, including a discussion of the structural and physical properties of wood 2d ed, enlarged New York John Wiley and Sons, Inc 157 p [plus 6 plates]

Wood identification with key

533. Record, Samuel J. 1934. Identification of the timbers of temperate North America, including anatomy and certain physical properties of wood New York John Wiley & Sons, Inc 196p [plus 6 plates]

Yellow-cedar wood has a light color, fine texture, and an odor described as being similar to turnips. Ray tracheids are common.


Gives a brief summary of the three North American species of Chamaecyparis, including yellow-cedar.


536. Rehder, Alfred. 1949. Bibliography of cultivated trees and shrubs hardy in the cooler temperate regions of the Northern Hemisphere Jamaica Plain, MA Arnold Arboreum, Harvard University 825 p

Gives 31 references to the sources of botanical names, valid names, and synonyms.
Nootkatin, a heartwood substance from yellow-cedar and three species of *Cupressus*, was found to inhibit growth of a number of fungi at 0.001- to 0.002-percent concentrations. This compound is judged to be extremely active and is largely responsible for yellow-cedar's decay resistance. Chamic acid from yellow-cedar heartwood inhibited fungi at 0.01 to 0.02 percent.


The high volatile-oil content of Port-Orford-cedar and yellow-cedar affected moisture determination by the oven method. Correction factors for electrical resistance meters were based on moisture determinations by the Karl Fischer method, which were consistently lower than previously published values.


The author describes morphological differences of seeds, cones, and seedlings as the basis for distinguishing nine separate species of *Chamaecyparis*.


Observed yellow-cedar in bogs and forests near Dixon Harbor on the mainland north of Cross Sound and east of Glacier Bay, Alaska.


Describes black stain from the heartwood of yellow-cedar in British Columbia. The author also isolated the fungus *Phellinus weirii* from yellow-cedar and reports no antagonism between this fungus and the black stain fungi.

Gives a brief description and an illustration and lists uses of yellow-cedar.


Mentions that yellow-cedar, under the name Thuya excelsa, grows with Acer macrophyllum (bigleaf maple) at latitude 55° N. Describes the flora of the Sitka area and includes portions of Merten's 1833 letter giving observations on yellow-cedar there. Yellow-cedar appears on a list of eight conifers on pages 454-455.


Provides background information on operational cloning of yellow-cedar using a large-scale steckling (rooted cutting) program for regeneration that began in British Columbia during the 1970s. Compares field performance of stecklings and seedlings. Reports on short-term and longer term genetic gain through clonal testing and selection. The author states that up to 750,000 stecklings were produced annually for this purpose as of the writing of this report.


Places yellow-cedar as an intermediate tree species with less genetic differentiation associated with geography than some species such as western hemlock and Sitka spruce, but more differentiation than species such as western redcedar. Significant population and family genetic variation exists for the traits measured, with family variation exceeding that of populations. Drought-resistant ecotypes are evident in the southern portion of the range, but elsewhere, some associations of traits with seed origin were mainly nonsignificant.

Outlines two clonal programs to produce planting stock in British Columbia, including one using yellow-cedar.


Reports that 500,000 yellow-cedars were planted along coastal British Columbia for reforestation during 1988, 87 percent of which were from rooted cuttings. Younger donor stock and donor stock that is continually hedged back to 25-50 cm produce the most reliable cuttings for rooting.


Genetic variability for provenance, family, and clones of yellow-cedar is described. Genetic improvement through provenance testing and a breeding program is discussed.


Results from a study on fertilization of rooted cuttings for reforestation indicate that the fertilizing of cuttings should begin at callusing for juvenile cuttings and at rooting for more mature cuttings.


Briefly describes the range, occurrence in scattered and sometimes nearly pure stands, soil associations, and lack of management information for yellow-cedar.


Gives results of tests of cold resistance in twigs and saplings of several tree species including three species of Chamaecyparis. No samples of Chamaecyparis survived temperatures below minus 25 °C. In general, conifers from very cold climates were the most resistant to frost damage.


A correction table from a direct-current resistance method are given for moisture values of the woods from different tree species, including yellow-cedar. The correction values, which should be added to actual meter values, are generally minor except at low moisture levels.


Mentions yellow-cedar as a large tree of great economic value and briefly describes its wood properties and anatomy under the name "Chamaecyparis Nutkaensis." Tables provide measurements of specific gravity, fuel value, strength properties, and weight.


Gives a brief description of yellow-cedar and its occurrence in the United States. Contains information on wood properties.


Provides a description of growth form, foliage, flowers, cones, and seeds. Gives the known distribution at the time of publication and a few properties and uses of wood. Uses the common names "yellow cypress" and "Sitka cypress." Mentions that yellow-cedar was introduced into European gardens in 1850 through the Botanic Garden at St. Petersburg. Ends with a beautiful botanical illustration of yellow-cedar in this oversized book.


Gives a description of foliage, flowering, cones, seeds, bark, wood, habit, and distribution.

Gives elevation limits for yellow-cedar and describes its vegetative reproduction. Yellow-cedar is listed as a tree species with low tolerance to fire.


Information is presented to assist with the identification of tree species, including yellow-cedar, on aerial photographs. A view drawing from above the crown of a yellow-cedar tree is given.


Reports on 10 years of experience with regeneration at high elevation along the coastal mainland in British Columbia. Species classified as coming from high elevation tended to have better survival but poorer growth than those from low elevation. Yellow-cedar was among species that suffered mortality at fall planting because of the lack of dormancy, especially at the site with the harshest winter climate. It developed problems in form on some sites (i.e., sweep, stem breakage, forked leaders). Yellow-cedar had longer lateral branches than other high-elevation species.


Wet-heating schedules lowered decay resistance of some species tested, including that of yellow-cedar. No decrease in resistance occurred at 1800 °F for 48 hr, but decay resistance was lowered after heating for 1 hour at 3000 °F.


The wood from yellow-cedar showed considerably more decay susceptibility, as measured by weight loss, when challenged with the fungus *Postia (Poria) placenta* compared to challenges by the fungus *Gloeophyllum trabeum*. From this result, the author concludes that yellow-cedar wood is very resistant when used in service aboveground but has only moderate resistant when used in contact with the ground.


Beginning on page 127, the author describes the growth habits, varieties, distribution, plantings in Europe, and wood characteristics.

Adventitious rooting of yellow-cedar is noted on Vancouver Island.


Describes a study in Elk Valley, Vancouver Island, on two aspects between 1,000 and 4,600 ft. Length of the frost-free season decreased at the rate of 2 8 d per 500 ft of elevation within the altitudinal range of Douglas-fir, western hemlock, and western redcedar, but above this level the frost-free season decreased 36 d in 500 ft. Yellow-cedar, subalpine fir, Pacific silver fir, and mountain hemlock were not affected by the temperature boundary. Yellow-cedar occurs from the 1,000- to 5,000-ft elevation at the study site.

574. Schoenike, R.E. 1977. Leyland cypress for Christmas trees. Limbs and Needles. 5-4-5,13

Describes the hybrid Leyland cypress and recommends it for use as Christmas trees.


Presents a method of estimating the timber volume of yellow-cedar and other tree species in southeast Alaska, given the height of trees and percentage of crown closure.


Lists 12 fungi known to occur on yellow-cedar.


Provides color illustrations of the symptoms of dying yellow-cedars and a stand-level view of cedar decline in Alaska. Includes the stand composition and mortality levels of different tree species at 13 locations. The cedar bark beetle, previously thought to be the cause of mortality, was found to be a secondary agent, attacking only trees already in decline.

Reports on sampling of yellow-cedar decline on Chichagof Island, Alaska. Declining stands often have 50 percent or more of their total volume in yellow-cedar, of which 25 percent or more is dead or dying. The cedar bark beetle and the fungus *Armillana* sp. are secondary agents.


Attempts to identify isolates of the fungus *Armillaria* from Alaska. Of the three isolates taken from yellow-cedar hosts, none was positively identified. Yellow-cedar seedlings were not infected by inoculations of any of the *Armillana* isolates used, but one of the isolates from yellow-cedar was able to infect Sitka spruce seedlings.


The author makes the first known reference to extensive yellow-cedar mortality by commenting on the forests around Pybus Bay on southern Admiralty Island, "vast areas are rolling swamps with yellow cedar, mostly dead."


Discusses the major forest types in Alaska and their distribution. Indicates that yellow-cedar is frequently associated with western hemlock from Valdez to the southeastward. Gives a distribution map of yellow-cedar and several other tree species in Alaska.


Yellow-cedar seedlings respond to both photoperiod and moisture stress treatments with a slight increase in cold-hardiness.

The growth retardant mefluidide was applied to yellow-cedar seedlings and two other species in a study of drought resistance. Mefluidide affected water potential, stomatal conductance, and the accumulation of abscisic acid.


The effects of photoperiod, water stress, and low temperature on frost hardiness were examined for yellow-cedar, western redcedar, and white spruce. Under natural conditions in British Columbia, yellow-cedar began to cold-harden in late October when the photoperiod was less than 11 hr and daily maximum temperatures were less than 15 °C. Yellow-cedar attained a higher degree of cold hardiness when exposed to persistent subfreezing temperature. Under controlled conditions, water stress had a minimal effect but exposure to daily intervals of 9-hr at 2 °C with light and the remainder of time at -3 °C with darkness increased the rate of hardening for yellow-cedar.


Describes many species, including yellow-cedar, grown in several aboreta in the United States.


Describes a method for germinating the seed of yellow cedar. Also outlines the cultivation and outplanting of yellow-cedar stock in British Columbia.


A new species of mite, Trisetacus chamaecypari, is described from yellow-cedar. The mite was found in the cones of yellow-cedar on Vancouver Island.


Constants $a$ and $b$ for 24 tree species are given for the combined variable formula in which tree volume ($V$) is estimated in terms of $d$, $h$ squared ($D^2$) and total height ($H$).

$$V = a + b[(D^2H)/100]$$
The same constants are used for yellow-cedar and western redcedar, a set being tabulated separately for coast-immature, coast-mature, and interior trees by diameter classes of 0 to 26 in and 27 in and greater. Standard errors for very tall and very short trees also are tabulated.

593. Smith, J. Harry G.; Breadon, Robert E. 1964. Combined variable equations and volume-basal area ratios for total cubic-foot volumes of the commercial trees of B.C Forestry Chronicles. 40 258-261


Presents a method for quantifying nootkatin from yellow-cedar heartwood Reports on the reduction of nootkatin around heartwood areas colonized by black-staining fungi. Two of these fungi show in vitro resistance to nootkatin.


Reports on a study of black stain in the heartwood of yellow-cedar from British Columbia. Comments that a small amount of stain is present in nearly all boards and is frequently associated with knots (i.e., limbs), breaks, and decay. Stain is apparently more common from trees growing on poor sites Six taxa of fungi were isolated from stained wood but none was positively identified. None of the black-stain fungi was capable of causing significant weight loss in yellow-cedar heartwood, however, colonization by these fungi made heartwood considerably less resistant to the subsequent attack by wood decay fungi. The author suggests that black stain fungi may reduce the durability of yellow-cedar heartwood by detoxifying compounds such as nootkatin and allow for the advance of actual wood decay fungi.


The timber types containing yellow-cedar that are given in this report are slightly modified in the 1964 edition (see item 597).


The composition, nature, and occurrence of the numbered timber types in which yellow-cedar occurs are described. At high elevations (in the mountains), yellow-cedar occurs in the mountain hemlock-subalpine fir type (205) In middle elevations (interior), yellow-cedar occurs in the western hemlock (224), Pacific silver fir-hemlock (226), western redcedar-western hemlock (227), and western redcedar (228) types.


*Cyphostethus tristriatus* (F), a green and brown bug, formerly thought to be virtually monophagous on *Juniperus communis* L, was found to feed and breed on *Chamecyparis nootkatensis* planted in Ascot, Berkshire


Establishes and formally describes the genus *Chamaecyparis* Moves yellow-cedar from *Cupressus* to this new genus under the name ' *Chamaecyparis nutkaensis* Spach " The original spelling of the epithet used by D Don in the formal species description (Don 1824) should be followed, thus the binomial should read *Chamaecyparis nootkatensis* (D Don) Spach


Volume of yellow-cedar growing stock in Pierce County, Washington, in 1959 was reported to be 16 million board feet (International 1/4-in rule) Volume of sawtimber on commercial forest land was 15 million board feet (Scribner) Area of commercial forest land occupied by yellow-cedar type was 1,000 acres, all in public ownership

602. Spada, Benjamin; Usher, Jack H. 1955. Forest statistics for Yakima County, Washington For Surv Rep 121 Portland, OR US Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station 29 p


Lists the locations where yellow-cedar is planted outside of its native range, including Belgium, British Isles, Denmark, France, Germany, India, Italy, Latvia Netherlands, Norway, Poland, Sweden, and Switzerland


Examines in detail, by dynamic physical methods, the capillary structure of six western conifers including that of yellow-cedar Includes measurements of wood density, diameter of pores of the pit membrane, lumen diameter, and tracheid length

The occurrence of yellow-cedar and other vegetation around bogs is noted in southeast Alaska. The authors present evidence from soil profiles to suggest that bogs were once more dominant on the landscape than they are today.


Gives a description of the appearance of yellow-cedar and western redcedar. The author describes in detail and illustrates the methods and tools used in the traditional collection of wood, bark, branches, and roots from cedar trees. Sections in the book include the construction of items from wood including canoes, buildings, totem poles, paddles, toys, fishing hooks, spears, arrow shafts, masks, instruments, bowls, and utensils, items constructed from bark including hats, temporary shelters, boxes, bailing rope, baskets, mats, blankets, and clothing, items made from branches including rope and baskets, and items made from roots including baskets, hats, and other woven products.


Describes the appearance and use of yellow-cedar wood.


Briefly describes the ornamental use of yellow-cedar and other Chamaecyparis species in Great Britain.


Reports on mycelial inoculation into the bark of 2- to 3 yr-old greenhouse-grown plants and 10-yr-old field-grown trees of Chamaecyparis nootkatensis and other tree species Chamaecyparis nootkatensis rapidly overcame initial infection. Methods of control and aids in identifying the fungus in culture are given.

610. Sturrock, J.W. 1976. Leyland cypress trials 3 Northern North Island plantings and first results Farm Forestry 18(1) 7-15

611. Sturrock, J.W. 1989. The Stapehill Leyland cypresses New Zealand Tree Grower 10(2) 18-19


Mentions seven common names and 14 cultivated varieties for yellow-cedar. Also lists synonyms of the scientific name.


Lists the following common names in use: yellow cedar, Sitka cypress, yellow cypress, Nootka cypress, Nootka Sound cypress, Alaska ground cypress, and Alaska cypress. Fourteen varieties are distinguished in cultivation: viridifolia Sudw., cinerascens Sudw., cinerascens genuina Sudw., cinerascens aureo-dis-color Sudw., argenteo-varians Sudw., aureo-versicolor Sudw., zanthophylla Sudw., pendens Sudw., compacts (Veitch) Beissn., compressa Beissn., nidiformis Beissn., albo-picta Sudw., aureo-viridis (Hort. Kew.) Sudw., picta Sudw. Accepted scientific and common names are Chamaecyparis nootkatensis (Lamb) Spach and yellow cedar, respectively.


Lists the trees of the United States. Suggests the common name Alaska cedar for Chamaecyparis nootkatensis.


Describes deer browsing as being so severe on the Queen Charlotte Islands in British Columbia that western redcedar and yellow-cedar are probably eliminated as commercial species.


Seedlings of 22 species of conifers found in Canada were inoculated with the pinewood nematode. Yellow-cedar was among four species that had no mortality from inoculations.
Ottawa Canadian Forestry Service, Department of Fisheries and Forestry
Bi-monthly Research Notes 25(4) 32-33

The yields of several compounds that were extracted from the outer bark of yellow-cedar and six other conifer species are reported

isolation and structure determination absolute stereochemistry chemical simulation of biogenesis Seattle, WA University of Washington 259 p Ph D dissertation

621. Tabata, Masanobu. 1991. Distribution and host range of Seiridium unicorne in Japan Transactions of the Mycological Society of Japan 32 259-264

The resinous canker disease caused by the fungus Semdium unicorne is reported on yellow-cedar and a number of other species of Cupressaceae from the Kanto district of Japan

Washington, DC U S Department of Agriculture 63 p (Revision of Misc Publ 55)

Gives a description of the foliage, twigs, cones, bark, and wood of yellow-cedar Includes information on size, occurrence by elevation, range in Alaska, and uses of wood

623. Taylor S.; Sziklai, O. 1976. Chamaecypans nootkatensis yellow-cedar member of the family Cupressaceae Davidsonia 7(4) 56-62

Provides a description of the morphology, distribution, and habitat of yellow-cedar in British Columbia as well as information on ornamental varieties and hybrids Discusses several uses of yellow-cedar, including the medicinal use of foliage and bark Gives a line drawing illustration of yellow-cedar


625. Terauchi, Fumio; Kubo, Mitsunori; Aoki, Hiroyuki; Ogama, Toshimasa. 1996. Effect of odors from coniferous woods on contingent negative variation (CNV) Zairyo (Japan) 45 397-402

Contingent negative variations and electroencephalograms were recorded from 10 humans subjected to the odors from the wood of several conifer species, including yellow-cedar Responses seemed to be due to the concentration of alpha-pinene in the wood

University of British Columbia 16 p

Gives log specifications used in bucking

Discusses the factors that control the distribution of tree species of climax communities at various elevations in a portion of the Cascade Range. Similar distribution patterns were found in other areas of the Cascades.


Briefly describes the wood of yellow-cedar.

629. **Torgeson, D.C.; Young, R.A.; Milbrath, J.A. 1954.** *Phytophthora* root rot diseases of Lawson cypress and other ornamentals. Bull 537, Corvallis OR, Oregon Agricultural Experiment Station.

Yellow-cedar was resistant when inoculated with *Phytophthora cinnamomi*, the cause of a root disease of Port-Orford-cedar and other trees.


Lists yellow-cedar, referred to as "*Thuja excelsa* Bong," along with seven other conifers. Indicates that it can be found at Sitka and "Southern Russian America.'


Lists some characteristics of yellow-cedar, describes its distribution in British Columbia, and provides details on use of the tree by Native people.

The cultural significance of yellow-cedar and other tree species within the traditional territories of two groups of Native people in interior British Columbia is discussed. Lillooet people close to the coast distinguish between yellow-cedar and western redcedar, but those further inland do not. Yellow-cedar wood is used for paddles and bows, and the strong odor of the tree is thought to cause illness.


Yellow-cedar makes up 8 percent of the volume and 15 percent of the value of wood exported from British Columbia to Japan. Demand is high because yellow-cedar is a good substitute for hinoki cedar, which is the native *Chamaecyparis* that is in short supply in Japan. Desirable lumber dimensions and the uses for wood in the Japanese market are described.


Describes the occurrence of yellow-cedar on a terrace near Lituya Bay in Alaska. Suggests that soil development processes lead to sites becoming more poorly drained overtime leading to successional changes favoring bog vegetation.


Approves of the common name change from Sudworth's (1927) "Alaska cedar" to "Alaska yellow-cedar." Suggests that it is desirable to retain the name "yellow" because of the tree's yellow wood. The committee prefers to hyphenate the name because the tree is not a true cedar and recommends not combining yellow and cedar to form "yellowcedar".


One pound of cleaned yellow-cedar seed contains from 66,000 to 180,00 seeds, with an average of 108,000. Germination is characteristically low with germinative capacity ranging from 0 to 2 percent and potential germination from 22 to 57 percent. Stratification for 60 to 90 days at 410 °F is recommended to break embryo dormancy. The seed is fragile.
Contains basic information on yellow-cedar wood as a material of construction with data for its use in design and specification.


Presents a series of standard terms for describing properties of various species of wood, including yellow-cedar, as developed by the Forest Products Laboratory.


A general discussion of mechanical properties, pulp and papermaking characteristics, seasoning data, and preservative treatment of various Alaska woods, including yellow-cedar. Includes summary tables on strength properties, pulp processes and yields, and drying schedules.

643. U.S. Department of Agriculture, Forest Service. 1966. 1966 seed and planting stock dealers. Tree Planters' Notes 78. 29 p

The directory lists four sources of yellow-cedar seed and one source of planting stock.


Provides engineers, architects, and others with a source of information on the physical and mechanical properties of many species of wood, including yellow-cedar, and how these properties are affected by variations in the wood itself.


Provides brief comments about the appearance of foliage, cones, and bark of yellow-cedar. Mentions that yellow-cedar can be found from sea level to timberline in southeast Alaska but is common between 500 and 1,200 ft. Includes a botanical illustration of yellow-cedar.

647. van Dersal, William R. 1938. Native woody plants of the United States, their erosion control and wildlife values Misc Publ 303 Washington, DC U S Department of Agriculture 362 p

Mentions several characteristics of yellow-cedar including size, soil and light requirements Information about seed includes its low production by the tree, transient viability, and weight of 106,000 seeds per pound

648. van Elk, B.C.M. 1969. New experiments on conifer propagation Gartenwelt (Hamburg) 69 303-304

Describes experiments on propagation by cuttings of yellow-cedar and other species using various combinations of soil heating, growth substances, and a fungicide


Measurements on growth of yellow-cedar and several other species in Alaska are used to develop equations relating periodic annual cubic-foot volume growth to tree diameter Results show differences in productivity among soil groups


Free water is necessary for paint blistering and water vapor alone does not cause it Susceptibility to paint blistering decreased by species in this order Thuja plicata, Pseudotsuga taxifolia (now P menziesii), Chamaecyparis nootkatensis, Pinus strobus, Juniperus virginiana, Pinus resinosa, and Picea spp


Lists the heartwood of yellow-cedar along with two other tree species that have resistance from attack by the aggressive forest products decaying fungus, Poria incrassata Note This fungus is now known as Meruliporia incrassata


Mentions the occurrence of yellow-cedar in several of the hierarchical levels of the classification scheme for plant communities in Alaska Yellow-cedar can achieve dominance in the western hemlock-Alaska-cedar and mixed-conifer communities

Yellow-cedar is listed in level IV and level V groups of open conifer forest in a preliminary vegetation classification for Alaska.


Provides common names, the distribution in Alaska, and uses of yellow-cedar. Also gives brief descriptions of the growth form, foliage, twigs, bark, wood, cone, and seeds. Includes an illustration of a branch. Lists the northwest limits of the distribution in Prince William Sound at Wells Bay and Glacier Island.


Gives a map of the known distribution of yellow-cedar in Alaska. Mentions several locations at the northwest limits of the range, including Latouche Island in Prince William Sound.


The authors review literature on the peatlands of the Pacific Coast and contrast concepts of classification with those of Europe and North America. They present a detailed analysis of the vegetation of peatland areas near Prince Rupert and adjacent areas of British Columbia. Yellow-cedar has the highest abundance in two vegetation groups where it is frequently the dominant tree species: mesotrophic woodland and minerotrophic lawn. Both are on soligenous fens. These two groups are characterized by soils that are relatively minerotrophic and less acidic and have higher calcium concentrations.


Soil arthropods are reported from a forest containing yellow-cedar and a logged and a burned site in British Columbia. Densities of Acari, Collembola, and other arthropods were reduced by logging and burning, but neither treatment induced total mortality of insect taxa.
658. Wade, Leslie Keith. 1965. Plant associations of the sphagnum bog ecosystem at Tofino Vancouver Island In Krajina, V J , ed 1964 progress report ecology of the forests of the Pacific Northwest Vancouver University of British Columbia, Department of Biology and Botany 15-16

A report on the vegetation of a marine terrace adjacent to the coastal beaches of Wickannish Bay, near Tofino, Vancouver Island Ten tentative plant community types are described, two of which contain yellow-cedar Pinus contorta-Chamaecyparis nootkatensis, a community restricted to bog periphery and incorporating both bog and forest elements in its composition and Bog Forest, a forest of characteristically dwarfed conifers surrounding the bog area The latter is extensive and probably represents the final stage in succession from the bog The dwarfed and peculiarly shaped condition of the trees is due to poor drainage and scarcity of nutrients Principal trees are Pinus contorta, Thuja plicata, C nootkatensis, Tsuga heterophylla, and Taxus brevifolia


The abundance of small mammals (e.g., deer mice and voles) is reported from clearcuts and an old-growth forest composed of 9 percent yellow-cedar on Vancouver Island, British Columbia


Information on the storage of conifer seed is given


Gives a brief description and distribution map of yellow-cedar in Oregon and Washington and illustrates the foliage, cones, and seeds


Outlines regeneration methods for yellow-cedar and other tree species in British Columbia Clearcutting combined with planting is the recommended method, although clearcutting in combination with natural regeneration, seed tree, shelterwood, and selection cutting also is listed as feasible

The purpose of the report was to make the collections existence known Lists seven specimens of yellow-cedar.


Gives grading rules for domestic and export grades used for yellow-cedar and other western conifers in the United States


Reports on a study involving the growth from rooted cuttings of Leyland cypress, the hybrid that formed between yellow-cedar and Cupressus macrocarpa. February is the optimal time to take cuttings for rooting The author suggests that the ultimate shape of a tree may be determined by the position from which the cutting was taken from the donor tree and the age (i.e., juvenility) of the collected material.


In the vicinity of the Strait of Georgia, yellow-cedar is seldom found below 2,000 ft and extends up to 5,000 ft. Northward, it gradually descends to tidewater at Knight Inlet In British Columbia, yellow-cedar occurs as far north as the Stikine River. Clear yellow-cedar is perhaps the highest priced lumber produced in the Province, as high as $100 per thousand board feet having been paid for it by local boatbuilders. There is an estimated 4,056 million board feet of standing timber in the Province.


The range of yellow-cedar in the Klamath region suggests that it is a relict from glacial time. It is confined to three isolated patches in the extreme southern end of its range, two of these reported by Mason (1941) and one found by Whittaker on Preston Peak.


Gives a key to two Chamaecypans species, Port-Orford-cedar and yellow-cedar, which are distinguished by bark thickness in mature trees, the color and prickly feel of foliage, and heartwood color.

*Cupressocyparis leylandii* has been planted in the University of Washington arboretum where it has grown well. It promises to be one of the best evergreen screening and hedge plants for the area.

670. Wolf, Carl B. 1948. The new world cypresses Part I Taxonomic and distributional studies of the New World cypresses El Aliso 1 1-250

A concept of the genus *Cupressus* is discussed, as is the more general concept used by Linnaeus *Chamaecyparis* is the genus most similar to *Cupressus* but differs by the former having smaller female cones, which generally mature in 1 yr, only one to four or five seeds per scale, and flattened, quadrangular or terete branchlets. Wolf does not take a stand on whether *Chamaecyparis* species should be included in the genus *Cupressus*, but most of the paper deals with the non-*Chamaecyparis* species, the true cypresses, "Eu-Cupressus." Wolf quotes in its entirety an article describing hybridization between *Cupressus macrocarpa* and *Chamaecyparis nootkatensis* (Jackson and Dallimore 1926). Wolf states that he had not seen either living or pressed specimens of the resulting hybrid (*Cupressocyparis leylandii*), but that the evidence presented by Jackson and Dallimore for its origin is convincing.


Discusses 22 specimens of fossil remains of yellow-cedar foliage and cones and other vegetation in western Nevada. The author speculates that the Nevada occurrences were different physiological races of yellow-cedar adapted to a drier climate.


There appears to be no generalized climatic limit in Great Britain for *Chamaecyparis nootkatensis*. The species has low requirements and is worthy of trial at high elevations.


A yellow-cedar tree from southeast Alaska was among several trees studied for root dimensions and geometry. Several equations are developed: stem diameter and mean initial root diameter, initial root diameter and length of lateral root, and root length and number of root branches.


Yellow-cedar does not have a wide distribution in the United States because it requires a moist climate. It is not used much on the Pacific coast but is considered one of the finest trees where it can be grown.

The steps in the synthesis of nootkatone are outlined. Nootkatone is a ketone that was first isolated from the heartwood of yellow-cedar and, later, the peel oil of grapefruit.


Pages 103 and 104 treat the genus Chamaecyparis. Reports that yellow-cedar flowering occurs in May or June, cones ripen in September, and seed dispersal is from October through the following spring. Relatively good seed crops occur roughly every 4 years. On average, there are 240 seeds per gram. Seeds can be difficult to germinate, and a suggested seed stratification is given.


Results are presented from a study of heartwood of 14 species of Cupressaceae, which were examined by paper partition chromatography for the tropolones present.


In tests on Scirpus-Calluna-Molina, yellow-cedar has grown slowly, even when fertilized with phosphate, with heights of 3 ft at 12 yr after planting. Unfertilized controls reached 2 ft in height. On poorer soil, yellow-cedar reached 3 to 4 ft 16 yr after planting. Smaller plants were damaged by frost in spring 1947.


Provides information on the only known rust species of yellow-cedar, Gymnosporangium nootkatense. Describes the life cycle, including the infection of the alternate hosts Malus diversifolia and Sorbus sitchensis. The fungus infects yellow-cedar through its entire range but not at levels causing tree damage. An excellent photograph of the uredial stage of the fungus on yellow-cedar appears on page 129.


A description of the stems of yellow-cedar and several other conifer species rooting adventitiously in tephra deposits after the 1980 eruption of Mount St Helens in Washington.
<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlantic white-cedar</td>
<td>Chamaecyparis thyoides (L) B.S.P.</td>
</tr>
<tr>
<td>Baldcypress</td>
<td>Taxodium distichum (L ) Rich</td>
</tr>
<tr>
<td>Bigleaf maple</td>
<td>Acer macrophyllum Pursh</td>
</tr>
<tr>
<td>Birch</td>
<td>Betula spp</td>
</tr>
<tr>
<td>Brewer’s spruce</td>
<td>Picea brewerana Wats.</td>
</tr>
<tr>
<td>California red fir</td>
<td>Abies magnifies A. Murr.</td>
</tr>
<tr>
<td>Common juniper</td>
<td>Juniperus communis L.</td>
</tr>
<tr>
<td>Douglas-fir</td>
<td>Pseudotsuga menziesii (Mirb.) Franco</td>
</tr>
<tr>
<td>Eastern redcedar</td>
<td>Juniperus virginiana L</td>
</tr>
<tr>
<td>Eastern white pine</td>
<td>Pinus strobus L</td>
</tr>
<tr>
<td>Grand fir</td>
<td>Abies grandis (Dougl. ex D. Don) Lindl.</td>
</tr>
<tr>
<td>Hiba Arbor-vitae</td>
<td>Thujopsis dolabrata (Lif.) Sieb. &amp; Zucc.</td>
</tr>
<tr>
<td>Hinoki cypress</td>
<td>Chamaecyparis obtusa (Sieb. &amp; Zucc )</td>
</tr>
<tr>
<td>Incense-cedar</td>
<td>Libocedrus decurrens Torr.</td>
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<tr>
<td>Leyland cypress</td>
<td>Cupressocyparis leylandii</td>
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<tr>
<td>Lodgepole pine</td>
<td>Pinus contorta Dougl. ex Loud.</td>
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<tr>
<td>Monterey cypress</td>
<td>Cupressus macrocarpa Hartw</td>
</tr>
<tr>
<td>Mountain hemlock</td>
<td>Tsuga mertensiana (Bong.) Carr.</td>
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<tr>
<td>Noble fir</td>
<td>Abies procera Rehd.</td>
</tr>
<tr>
<td>Ohia</td>
<td>Metrosideros polymorpha Gaude</td>
</tr>
<tr>
<td>Northern white-cedar</td>
<td>Thuja occidentalis L</td>
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<tr>
<td>Pacific silver fir</td>
<td>Abies amabilis Dougl. ex Forbes</td>
</tr>
<tr>
<td>Pacific yew</td>
<td>Taxus brevifolia Nutt.</td>
</tr>
<tr>
<td>Para angelwood</td>
<td>Dicorynic paraensis</td>
</tr>
<tr>
<td>Port-Orford-cedar</td>
<td>Chamaecyparis lawsoniana (A. Murr) Parl.</td>
</tr>
<tr>
<td>Red pine</td>
<td>Pinus resinosa Alt.</td>
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<tr>
<td>Red spruce</td>
<td>Picea rubens Sarg.</td>
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<tr>
<td>Redwood</td>
<td>Sequoia sempervirens (D. Don) Endl.</td>
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<tr>
<td>Shasta red fir</td>
<td>Abies magnifica var. shastensis Lemm.</td>
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<tr>
<td>Sitka spruce</td>
<td>Picea sitchensis (Bong.) Carr.</td>
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<tr>
<td>Southern pine</td>
<td>Pinus spp.</td>
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<td>Subalpine fir</td>
<td>Abies lasiocarpa (Hook.) Nutt.</td>
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<td>Western hemlock</td>
<td>Tsuga heterophylla (Raf) Sarg</td>
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<td>Western larch</td>
<td>Larix occidentalis Nutt.</td>
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<td>Western redcedar</td>
<td>Thuja plicata Donn ex D. Don</td>
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<td>Western white pine</td>
<td>Pinus monticola Dougl. ex D. Don</td>
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<tr>
<td>Whitebark pine</td>
<td>Pinus albiculis Engelm.</td>
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<tr>
<td>White oak</td>
<td>Quercus alba L</td>
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<tr>
<td>White spruce</td>
<td>Picea glauca (Moench) Voss</td>
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<tr>
<td>Yellow-cedar (Alaska-cedar)</td>
<td>Chamaecyparis nootkatensis (D Don) Spach</td>
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<tr>
<td>Metric and English Equivalents</td>
<td>When you know:</td>
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<td>-------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>inches (in)</td>
<td>2.54</td>
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<tr>
<td>feet (ft)</td>
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<tr>
<td>miles (mi)</td>
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<tr>
<td>cubic feet (ft^3)</td>
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<tr>
<td>acres</td>
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<tr>
<td>pounds (lb)</td>
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<tr>
<td>pounds per cubic foot (lb/ft^3)</td>
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<td>Fahrenheit (°F)</td>
<td>(°F-32)/1.8</td>
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<tr>
<td>millimeters (mm)</td>
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<tr>
<td>centimeters (cm)</td>
<td>0.39</td>
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<tr>
<td>meters (m)</td>
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<tr>
<td>cubic centimeters (cm^3)</td>
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<tr>
<td>hectares (ha)</td>
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<tr>
<td>grams (g)</td>
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<tr>
<td>kilograms (kg)</td>
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<tr>
<td>grams per cubic centimeter (g/cm^3)</td>
<td>0.58</td>
</tr>
<tr>
<td>kilograms per hectare (kg/ha)</td>
<td>0.089</td>
</tr>
<tr>
<td>Celsius (°C)</td>
<td>(9/5x°C)+32</td>
</tr>
</tbody>
</table>
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