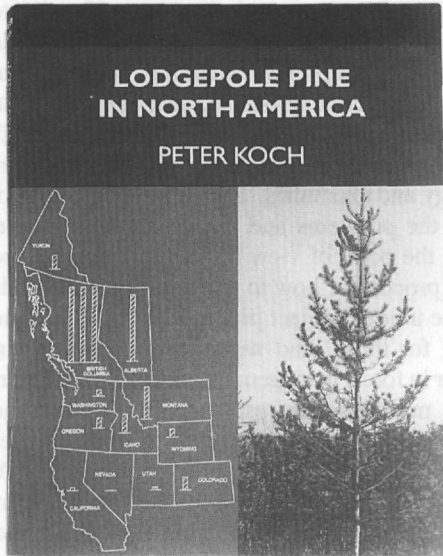


Book Review



Peter Koch. 1996. **Lodgepole Pine in North America**. Volumes I, II and III. Forest Products Society. Madison, Wisconsin. 1096 p. ISBN 0-935018-78-6.

Peter Koch is known worldwide as a brilliant inventor of wood processing and harvesting technology, and an author of monumental multi-disciplinary compendiums. In 1964 he published *Wood Machining Processes*. In 1972 appeared two volumes of *Utilization of the Southern Pines* (1663 pages), and in 1985 three volumes of *Utilization of Hardwoods Growing on Southern Pine Sites* (3710 pages), both as USDA Agriculture Handbooks. All are used widely, not only in the United States but also globally.

Much of Peter Koch's teen-age years was spent in Montana's forests of lodgepole pine, when he learnt to understand the lodgepole pine's huge potential as a resource of timber and non-wood products. As early as in 1956 he got the idea to write a holistic compendium of lodgepole pine in order to promote the silviculture and utiliza-

tion of this under-appreciated species. However, more urgent research obligations in the US South, such as work for improved utilization of southern woods, did not allow him the time to further this work. It was not until in 1982, when arrangements were made for Peter Koch to transfer from the Southern Forest Experiment Station of the USDA Forest Service in Louisiana to the Intermountain Forest and Range Experiment Station in Montana, that he was able to begin the giant task. Upon retirement from the US Forest Service in 1985 he established, with his wife Doris, the Wood Science Laboratory Inc. to fulfill the old plan.

The massive work was completed in 1995, and the book was published by the Forest Products Society in three volumes in late 1996. It is based partly on a synthesis of more than 6000 papers on lodgepole pine, and partly on a systematic collection and analysis of wood and bark from branches, stems, stumps, and roots, as well as of foliage, of lodgepole pines 76 mm, 152 mm and 228 mm in d.b.h. Samples were collected from low, medium, and high elevational zones at 2.5° intervals of latitude from 40° to 60°, i.e. from southern Colorado and central California north to the southern border area of Yukon Territory.

The three volumes make for 26 chapters. Four of the chapters (physiology; anatomy; pulp and paper; and attack on lodgepole pine by fungi, mistletoe, adverse atmospheres, animals and insects) were co-authored by specialists in the particular fields. Primary emphasis is given to those aspects of lodgepole pine characterization that affect its use.

The sub-title of the *first volume* is Background. It deals with the species, resource, physiology, silvicultural aspects and biotic and abiotic attacks.

In the United States (mostly in Montana, Idaho, Wyoming, Colorado, Oregon and Washington), the species covers 6 million ha, and in Canada (mostly in British Columbia and Alberta) 20 million ha. The growing stock (trees 12.7 cm in d.b.h. and larger to 10.2 cm top diameter outside bark) is estimated as 748 million m³ and 1.3 billion m³, respectively. Much of the resource is formed by 60 to 200 years old stagnated stands in which trees are small in diameter, growth very low and mortality very high. Three

major varieties of lodgepole pine are identified: lodgepole pine (*Pinus contorta* var. *latifolia* Engelm.), Sierra lodgepole pine (*P. contorta* var. *murrayana* (Grev. & Balf.) Engelm.) and shore pine (*P. contorta* Dougl. ex Loud. var. *contorta*).

Typically, lodgepole pine stands have received no treatment to accelerate growth and reduce mortality. Experience and literature concerning lodgepole pine plantations are mostly European. It follows that the text focuses mainly on unmanaged stands in which the primary factors affecting regeneration, stocking and growth have been bark beetles and wildfire. However, the author foresees the lodgepole pine resource as becoming more important as the knowledge and will to manage it increases. Consequently, the ultimate purpose of the book is to stimulate intensive management and the efficient use of the resource.

The resource is analyzed in a very detailed way paying attention to all biomass components of the tree. In addition to the traditional stem volume data, information is given on the green and dry mass of the stem, foliage, live and dead branches, cones and stump-root system. The number of tables and figures on resource data by varieties and geographic areas is sometimes overwhelming. The reader misses generic summary tables.

The second volume is composed of two parts: Nonwood Products and Characterization of Tree Parts. The first part deals with water, forage for livestock, wildlife and recreation. The second part, based largely on the field material collected and analyzed in several laboratories for this book, is a detailed presentation of the technical characteristics of tree components: stemwood, stem-bark, branches, foliage, cones and stumps and roots. A comprehensive chapter is given to each of the following issues: gross characteristics of tree components (stem form, bark thickness and volume, branch characteristics, needle dimensions, stump-root system volume etc.), anatomy, chemical constituents, specific gravity, wood-water relationships, mechanical properties, and defects in trees and logs. If insufficient knowledge of the technical properties of lodgepole pine has been a constraint on its utilization, this book undoubtedly overcomes that shortcoming. Few tree species have been studied in such a systematic way.

The third volume also is composed of two parts: Processes and Products. In accordance with the author's background, the emphasis is in the mechanical forest industries and their products. The part Processes includes a specific chapter for each of the following items: harvesting; debarking, milling and machining; drying; treating; and processing live vs. dead trees. The part Products includes the following chapters: solid wood products; composites; pulp and paper; and energy and chemicals. Throughout the third volume the problems and possibilities are studied from the point of view of lodgepole pine's specific properties: how to use this huge potential.

The unique project produced a valuable handbook for those who work with lodgepole pine either in forest management, timber procurement, mill, marketing or research. The book is addressed to the coming generation of researchers and managers in the lodgepole pine industry. An extensive subject index helps the reader to find the topics he is interested in. The reader may sometimes find it confusing that metric and English units are used alternately depending on the terminology of the original reference publication.

Since lodgepole pine is grown as an exotic in Sweden and the other Nordic countries, United Kingdom, Ireland and New Zealand, the book is of interest in many countries outside of the natural range of the species. In Sweden, there are 0.5 million ha of lodgepole pine, although the establishment of new plantations of exotics on such a scale may not be acceptable in the future for ecological and biodiversity reasons.

Lodgepole pine in North America is the result of more than ten years of systematic research by a pioneer scientist. The author and his wife Doris devoted more than ten years to the improved utilization of the largely untapped resource of 2 billion m³ of lodgepole pine in the United States and Canada. Peter and Doris Koch deserve our deep respect and congratulations.

Pentti Hakkila

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