

Physiological Ecology of Forest Production

J.J. Landsberg (1986), Academic Press, Orlando FL 32887, U.S.A. xvii + 198 pages. Cost \$US45.00.

The stated objective of this book is to analyse and explain the growth of forest trees as affected by the environmental conditions to which they are exposed. Emphasis is placed on understanding the physiological processes and on a quantitative analytical approach through modelling.

Modern physiological ecology has developed to the stage where a quantitative approach is desirable. Models are defined as formal and precise statements or hypotheses of the working of a system usually expressed mathematically.

Landsberg argues that the forest manager using this approach will be in a better position to make rational decisions than the manager who relies on empirical information and experience.

The environmental changes from pollution, climate change and the introduction of new breeds of trees makes predictions of growth and yield of tomorrow's tree crops using conventional forest mensuration models uncertain. While the development of process-based models for tree crops, as described by Landsberg, is still in its infancy, other industries based on plant husbandry make extensive use of these types of models.

This book does not present a mass of data; rather it concentrates on ideas and concepts. Growth of trees is an expression of the rates of the physiological processes and in Chapter 2 the author analyses rates of processes, their dependence on the weather and the interaction with other processes in the trees. Chapter 3 deals with stand structure and microclimate. As Landsberg notes, appreciation of the importance of stand structure in determining canopy microclimate will provide a better understanding of the responses of a forest to thin-

ning and fertilisation. The yield or volume increment of a forest depends on the rates of dry matter production via the conversion of radiant energy by leaves into carbohydrates. In chapters 4 and 5 carbon balances of leaves and of trees are discussed. A substantial part of the latter chapter is concerned with dry matter partitioning, e.g. how much of the total amount of carbohydrate produced is used as stem. This is of major importance in determining yield. Chapters 6 and 7 briefly discuss mineral dynamics and water relations. The former chapter is of more interest to New Zealanders and would augment most books on mineral cycling and nutrition of forests. I would recommend to those with a traditional forestry education, that Chapter 8 should be read after the Introduction (Chapter 1), as the different types of models used in forestry are discussed and some of the general concepts behind process-based models outlined; this provides the reader with a better perspective of the topics covered.

The book is well organised with each chapter and subdivision clearly defined. A concluding section to each chapter reiterates the important concepts covered. Of importance to those of us in New Zealand is the good coverage of the literature on *Pinus radiata* and *Eucalyptus* spp. The style of writing is easily readable and the reader should not be deterred by the mathematical approach and the many equations presented.

I recommend this book to forest scientists and students interested in the growth of forest plantations for its modern quantitative approach to physiological ecology. The practising field forester can also gain from reading this book as it shows how a biological, analytical approach can be of assistance in improving silvicultural practices and forests of the future.

D.A. Rook

Name Change

Some reorganisation within the Ministry of Forestry's Forest Research Institute has resulted in a name change for its Division in Christchurch.

The former Divisional name of Forestry Research Centre has been changed to Forest and Wildland Ecosystems, which reflects the range of research undertaken. Outside MOF it will continue to be known as Forest Research Institute, Christchurch.

What used to be the Indigenous Forest Management group at FRI Rotorua has become part of the Forest and Wildland Ecosystems Division and renamed Northern Wildlands.



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