

## BIODIVERSITY AND SUSTAINABLE FORESTRY

**G. Müller-Starck, editor, 1997: *Biodiversität und nachhaltige Forstwirtschaft* [in German].** Ecomed, Landsberg. 340 pages. Price 48 DEM, paperback. ISBN 3-609-69360-6.

Proceedings of an international 'Forum Genetics-Forests-Forestry' [Forum Genetik-Wald-Forstwirtschaft], latest in a well-known series of meetings focusing on the genetic aspects of forest science in German-speaking countries. The meeting was hosted by the Department of Forest Genetics of the Faculty of Forest Sciences, Munich University, in Freising, Germany, in October 1995.

The term 'sustainability' has been long and widely used in forestry but still lacks an ecologically genetic dimension. As emphasized in the foreword by Prof. Dr Gerhard Müller-Starck, the concept of *genetically* sustainable forestry is well in line with keeping the ecological, commercial and socio-economic interests balanced. The book aims at better establishing this concept, with a number of theoretical papers as well as contributions from the forestry practice included. The title may be slightly misleading because it gives the impression of a much more general biodiversity book.

In an effort to provide a very balanced view, the set of 22 original presentations from the meeting covers an entire spectrum of issues associated with genetic sustainability in forestry. They are divided into four chapters.

The first chapter is entitled "Biodiversity, genetics and forest tree breeding". In their introductory paper, HATTEMER & GREGORIUS, on the basis of new definitions presented, describe processes establishing the adaptive nature of ecosystems. It is argued that adaptability of a system, determined by its biological diversity, needs to take account of all the different levels of diversity- species, populations, genes.

Several other contributions to this chapter, presented or co-authored by acknowledged experts in the area, focus on the actual status, constraints and perspectives of tree breeding for assessing, conserving and enhancing adaptive genetic variation. BERGMANN & HOSIUS undertake an analysis of the biochemical, population genetic, evolutionary and historical factors behind isoenzyme polymorphisms. An interesting overview, emphasizing the dynamic balance of host-parasite interactions, which to a large extent depend on the underlying genetic diversity, is presented by STEPHAN.

The second chapter concentrates on the impacts of silvicultural management on biological, and specially genetic, diversity in forest tree populations. The 'classical' silvicultural possibilities for supporting diversity within and among species, taking into consideration their biotopes, are reviewed by SCHÜTZ. It is emphasized that rare species require particular attention. Two case studies are included in this chapter illustrating how concerns about plant diversity in general may be incorporated into management of a mixed mountain forest type. Another contributor to the chapter, STARKE studied genetic variation during the regeneration and successive stages in three beech stands with different silvicultural management. HUSSENDÖRFER compared genetic structures of a silver fir stand and its naturally and artificially regenerated progenies. Both papers, containing results of these studies based on isoenzyme investigations, show the effects of silvicultural treatment on genetic reproductive processes. Practical implications are indicated.

Procurement, transfer and use of reproductive material of both tree and shrub species, undoubtedly an essential task of genetically sustainable forestry, is the topic of the third chapter. MUHS gives a detailed and up-to-date report on the status and perspectives of the regulations on forest reproductive material in the international context. Promising first results of a study characterizing the genetic impacts of sorting practices in the nursery stage are given by KONNERT & SCHMIDT. Very interesting contributions to this chapter, and important points of view, are provided from the private suppliers of forest reproductive material.

In the last chapter "Genetically sustainable forestry", MÜLLER-STARCK calls for an effective integration of genetic criteria into forest management at a time when the overall economic and ecological conditions are changing rapidly. The role of genetic variability for adaptation and survival of long-lived forest tree populations is explained. Based on representative, convincing examples, measures are suggested which generally contribute to the implementation of the genetically sustainable forest management during the natural or artificial stand regeneration and thinnings. A forward-looking summary of the new opportunities faced by the forest tree breeding is provided.

The possibilities and problems of forestry practice associated with conserving diversity are reviewed critically by TABEL, DEGEN & SCHOLZ present a simulation model aimed at a holistic evaluation of silvicultural impact on the genetic system of populations. The applicability for decision making in genetically sustainable forestry is demonstrated on two examples. A very valuable experience of designating and managing gene reserve forests in Austria (MÜLLER) is provided at the end of the chapter.

It follows from the book that today's forestry practice, utilizing the entire range of products and services from forest ecosystems, can not underestimate the importance of genetics and genetic resources. The book is well balanced and conveys a clear message of forest genetics to all those working in the practice, integrating rather than simply showing differences.

A summary of the fruitful discussion, which was excellently steered during the meeting, is missing. Some introductory notes on the concepts used and terms repeatedly mentioned by authors of the individual contributions ('biodiversity', ecological genetics, *Naturwald*, sustainable management of forests), would have added more consistency and would have been useful particularly for readers not so well acquainted with forestry problems in the central European context.

All contributions have short summaries as well as captions of figures and tables in English. The proceedings offer an excellent, up-to-date overview and the contributions are well compiled from a formal point of view. They are recommended to readers from all forestry disciplines as well as those interested in broader issues of sustainability and biological diversity.

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