

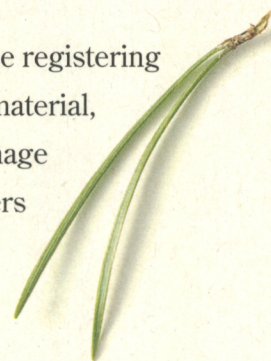


From cells to ecosystems and genes to populations

Forest genetics research covers a wide field ranging from genes to populations. One important area is the study, using biotechnological techniques, of the mechanisms through which trees maintain variation and adapt to their environment. The information is applied in breeding research which, in addition to developing the growth, quality and resistance properties of trees, is also aimed at maintaining the genetic diversity of the forests.

The aim of the Department of Forest Ecology is to produce information about the basic factors affecting the growth and development of forests, the functioning of mineral soil and peatland ecosystems, the biological principles involved in the growing of timber, the environmental effects of forestry, and the state of health of the forests. The Department has a modern laboratory which participates in research work and provides analytical services for the whole Institute.

The statutory tasks of the Department are the registering of forestation material, the testing of breeding material, and the inspection of pesticides. The forest damage service investigates cases of damage and answers the public's questions.



The relationships between the resistance of trees and damaging agents such as moose, voles, insects and plant pathogens are the main research topics of forest protection.

The properties of forest soils and stand growth factors are studied in field experiments using a wide range of physiological, microbiological and ecological methods. Research on soil nutrients and the maintenance of soil condition and fertility are important topics.

The laboratory, with its wide range of analytical instruments and equipment, provides the Department's research projects with chemical and biological know-how.

Understanding forest ecosystems — the basis of sustainable forestry

The research carried out on the basic functioning of forest ecosystems focuses on nutrient cycling and the utilization of nutrient reserves. The Department of Forest Ecology is in the SILMU Project, a national program on the effects of climate change e.g. on forest ecosystems. Changes in the flora and fauna, especially those involving the vegetation and insect populations, and outbreaks of damage and the state of health of the forests are regularly monitored by the Department at the national level. The sample plot network and data systems of the national forest inventory are utilized in this work.

The environmental effects of forestry are being studied both within



and outside the forest ecosystems. The efration, drainage and fertilization on watercourse quality are currently being investigated. The laboratory is fully employed analysing the tens of thousands of samples that accumulate as a result of the monitoring work.

From basic principles to applications

The results of research into the biological principles of forest growing are utilized in drawing up directions for the classification of forest site types, the growing and regeneration of forests, the regulation of the water and nutrient status of forests, the management of forest soil and how to reduce the risk of pest damage. A considerable proportion of this work, which is normally based on extensive field experiments, is carried out at the Institute's research stations. The ecological research performed at the individual research stations, each with its

own laboratory capacity, also concentrates on silvicultural and forest improvement questions of local and regional importance.

Research programs and projects to meet the challenges of today

In addition to the SILMU Program, the Department is also involved in national ecological projects and research programs. These include the LUMO Program on natural diversity, the METVE Project on the effects of

forestry on watercourses, and the international integrated monitoring program, IMP. The Institute's own State of Forest Health research program includes research into the state of health of the forests and its upkeep e.g. in Karelia on the Russian side of the border. The Department is participating in a number of European projects on environmental impacts, e.g. monitoring the condition and vitality of the forests, and the mapping of deposition.



THE FINNISH FOREST RESEARCH INSTITUTE METLA

Rillitie 12
PO. Box 18, 01301 Vantaa, Finland
phone +358-0-857 051
fax +358-0-857 2575

Unioninkatu 40 A
00170 Helsinki, Finland
phone +358-0-857 051
fax + 358-0-625 308

Director General Eljas Pohtila
Administrative Director Tero Oksa
Head of Communications Unit
Marja Ruutu

DEPARTMENT OF FOREST ECOLOGY

The Department is led by Professor Eero Paavilainen, Research Director,

Professors:

Insect damage	Erkki Annila
Peatland fertility	Seppo Kaunisto
Forest tree genetics	Veikko Koski
Forest pathology	Timo Kurkela
Forest soils	Eino Mälkönen

Research director's secretary	Marja-Liisa Henritius
Department's information officer	Brita Aarnio

Forest damage service	Katriina Lipponen
-----------------------------	-------------------

Central Laboratory:

Laboratory director	Maija Jarva
---------------------------	-------------