

Editor's summary

The following is the editor's condensed summary of the articles in the current issue.

- The needles of western red cedar (*Thuja plicata*) contain a toxic monoterpene known as thujone. Can the thujone have negative effects on the soil beneath a cedar stand? This question was raised by **Bjarne Strobel** and colleagues. They found sufficiently high levels of thujone in the forest floor of a Danish cedar stand to indicate that it may affect organisms in the soil and fresh water streams.
- Root rot, one of the main threats to timber stands in Scandinavia, can be combated by competing fungi species. **Mattias Berglund** and his colleagues at SLU compared a number of strains and species with respect to their protective effects against natural root rot infection. They found two *Phlebiopsis gigantea* strains to be highly effective, while others they tested worked less well. *Trichoderma* formulations did not reduce root rot infection.
- Breeding population sizes, and related issues, have long been concerns of tree breeders and researchers. A large population is costly to maintain, while a small population may lead to reduced diversity. **Darius Danusevicius** and **Dag Lindgren** calculated the optimal size to be between 30 and 70 individuals for Nordic conifer breeding programs, in order to balance diversity, genetic gain and budgetary constraints.



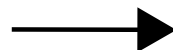
Photo: Skogforsk

High stumps, a common sight on modern clearcuts.

- In a Danish study by **Peter Brønnum** the frost hardiness at the time of lifting in the autumn was found to be a good indicator of the storability of Scots pine, but not of pedunculate oak. However, the oak was considerably more tolerant of early storage than the pine, suggesting that storability criteria may be less important for deciduous trees than for conifers.
- Noble fir seedlings are highly sensitive to desiccation stress. The survival and growth rates are extremely poor if whole seedlings are exposed to desiccating conditions for more than 0.5 h, but they can tolerate exposure for 10 h if their roots are protected, according to a Danish study by **Peter Brønnum**. Root electrolyte leakage from the plants before exposure could help to forecast the effects of desiccation.
- Seedlings are usually treated with insecticides against pine weevils in dormant conditions. **Jaana Luoranen** and **Heli Viri** tested if the insecticides used in Finland could also be used on actively growing seedlings. Treatment with GORI 920 damaged needles and reduced the following year's growth. Decis Tab and Karate Zeon caused no side-effects.

- High stumps are often left on clearcuts to promote diversity of insects and other organisms. **Mats Jonsell** and colleagues investigated 6-year-old high stumps in Sweden and registered all the beetles. They found that the diversity of the beetle community was heavily affected by the presence of two polyporous fungi: *Fomitopsis pinicola* and *Trichaptum abietinum*. The studied high stumps hosted at least five red-listed beetles.
- Traditionally, beech has been managed in even-aged stands which are naturally regenerated and finally clear felled. "Target diameter harvesting" offers an alternative, which better resembles the natural dynamics of beech forests. **Peter Tarp** and his colleagues have evaluated economic parameters of two alternatives for beech forestry. Target diameter harvesting was to be preferred at relatively high discount rates (>2%) and traditional even-aged management at lower rates (<1%).

cont. page 6



Forest research in the north – the province of Åland

The province of Åland, a group of islands between Sweden and the mainland of Finland, is a demilitarized, Swedish-speaking part of Finland with a wide degree of autonomy.

The small province, with its 26,000 inhabitants, is a minor actor in the Nordic forest sector. Nevertheless, productive forests cover 40% of its land area, and the forest plays important social, economic and ecological roles; in terms of income, biodiversity and recreation for instance. Åland has a permanent observer position on the SNS board.

Regional forest program

A regional forest program for Åland was recently started by the local government (Ålands landskapsstyrelse). The program, covering the period 2002–2006, was established to ensure sustainable economic, ecological and social development of the forest resources. A document



describing the program, available on the internet (see below), provides valuable background facts about the forests and forestry on Åland.

Since the 1950s, the Finnish Forest Research Institute (METLA), in collaboration with the forest agency of Åland, has been responsible for the majority of the forest research in the province.

Source: Regionalt skogsprogram för Åland 2002–2006, Ålands landskapsstyrelse. (download a pdf from <http://www.ls.aland.fi/naringsavd/skogsbruksbyran/skogsbruk.pbs>)

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Åland's forest in figures

Forest area: 61,700 hectares

Ownership: 91 % of the forest area is privately owned, and the average size of the holdings is only 23 hectares

Standing volume: 9 million cubic metres (almost a third of which is older than 80 years)

Annual volume growth: 317,000 cubic metres.

Annual harvest: 189,000 cubic metres (2003)

Average growth: 4.8 cubic metres per hectare and year

Tree species, % of volume:
Scots pine 55%
Norway spruce 22%
broadleaves 23%

Industrial use: The harvested timber is used mainly by two companies

Economic impact: The forest sector is small in terms of employment; only 0.6 % of all employees on Åland work in the sector. METLA estimated that 161 people are engaged full-time in it: 60 in forestry and 101 in forest industries

Sky, sea and forest - a picture of Åland. Photo: The government of Åland



Forest research in the north

See previous issues of Scandinavian Journal of Forest Research to read our summary presentations of research in the Nordic and adjacent countries. The News and Views sections can be downloaded freely from the SNS website

(www.nordicforestresearch.org).

CARs – new engines to promote Nordic forest research collaboration

Virtual Centres of Advanced Research (CARs) represent a new form of networking in Nordic forest research. Under the auspices of SNS, a number of CARs will integrate some of the currently active network groups.

The main aims of the CARs are to promote synergies and avoid overlaps in R&D work, i.e. to use the total

Nordic R&D resources as effectively as possible. Another important task is to attract external funding, e.g. from the EU.

The CARs will function as “virtual centres” while the main research is carried out by the partners. The partners will fund their own activities, while the SNS grant will support the networking activities of the centre.

Each CAR will focus on a specific field, as approved and funded by the SNS for a fixed duration (4–5 yrs), after which they will be evaluated.

The first round of applications for the CARs was held in the autumn of 2004. Four of the applications (outlined below) were approved and awarded grants.

1. CARE-For-Us

(Nordic-Baltic Centre of Advanced Research on Forestry Serving Urbanised Societies)

This centre will strengthen research on urban forestry within the region.

Urban forests refer to the tree-dominated green spaces in and around cities and towns. The concerns of the CAR include assessment of urban forests and their qualities, development of appropriate administrative policies, legal frameworks, public involvement and conflict management planning tools, and innovation of silvicultural and other management methods.

The CARE-For-Us partners are:

Forest & Landscape Denmark (coordinator)
Iceland Forest Research
Skogforsk, Norway (Norwegian Forest Research Institute)
Swedish University of Agricultural Sciences, Alnarp
University of Helsinki
Estonian Agricultural University
Estonian School Forest Society
SILAVA (Latvian State Forest Research Institute)

Contact: Cecil C. Konijnendijk
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Broadleaved trees; important in urban forests. Photo Martin Werner.

2. CAR-ES

(Centre of Advanced Research on Environmental Services)

This centre will focus on carbon sequestration, water protection and biodiversity.

Environmental research on forest ecosystems has largely concentrated on negative aspects such as the impact of clear-cuts, or air pollution. This CAR will instead highlight benefits – environmental services – that the forests provide.

The CAR shall develop a decision support system that can be accessed on the Internet by forest owners, decision-makers and the public.

The CAR-ES partners are:

Forest & Landscape Denmark (overall coordinator and task coordinator, water protection)
Skogforsk, Sweden (task coordinator, biodiversity)
Icelandic Forest Research (task coordinator, carbon sequestration)
Skogforsk, Norway
METLA (Finnish Forest Research Institute)
Metsäteho
Lithuanian Forest Research Institute
Latvian Forest Research Institute
Centre of Forest Protection and Silviculture, Estonia

Contact: Per Gundersen (coordinator),
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Water in the forest; a focus for Nordic research. Photo Skogforsk.

3. GENECAR

(Centre for advanced research in forest genetics and tree breeding)

This centre will promote and coordinate collaboration among Nordic forest geneticists and tree breeders, aiming to make their activities more cost efficient. Besides conducting advanced research, it will also disseminate research results to different end-users and stakeholders.

The following research projects will be included in the first phase of GENECAR:

- genetics of climate adaptation of boreal forest trees
- breeding of boreal forest trees
- gene research and biotechnology

- conservation genetics of Nordic trees and woody plants.

Partners of GENECAR:

Skogforsk, Norway (coordinator)
 Skogforsk, Sweden
 METLA (Finnish Forest Research Institute)
 Forest & Landscape, Denmark

Other research groups based in Nordic universities and institutions in the Baltic countries will also be included.

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Norway spruce cuttings – part of an advanced genetic improvement programme. Photo Skogforsk.

4. OSCAR

(Operation systems – centre of advanced research)

The aim of OSCAR is to promote research on operation systems, with special emphasis on technology and support systems. The following topics have been identified for initial inclusion:

- forest-energy techniques (including early thinning)
- secondary transportation
- man-machine interactions (including automation)
- wood-supply-chain management
- NSR-networking activities

Partners of OSCAR:

Skogforsk, Sweden (coordinator)
 Forest & Landscape Denmark
 METLA (Finnish Forest Research Institute)
 Metsäteho
 Skogforsk, Norway

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Man-machine interactions can be studied in a simulator environment. Photo Skogforsk.

Metla House – innovative uses of wood

The new three-storied Metla House in Joensuu, North Karelia, is the largest wooden office building in Finland.

The 225 strong staff of Metla's (Finnish Forest Research Institute) Joensuu Research Centre moved into the new building at the end of October 2004.

The goals of the construction were to use Finnish wood material in innovative ways and to create an inspiring working

environment for forest scientists. Wood is the main material used throughout the building, from the post-beam-slab system in the structural frame to the exterior cladding. The entrance to the courtyard is flanked by walls made of 100-year old timber. The walls have been weather-proofed by pine tar "terva", a traditional, natural wood preservative that is commonly used in Finland.

Source: www.metla.fi



Editor's summary, cont from p. 1.

- Forest management planning is usually based on field inventories at the stand level, but the stands are normally subjectively delineated. This is a drawback since different people delineate them in different ways. **Pekka Hyvönen** and his colleagues evaluated the efficiency of an alternative method, in which inventories are based on segments derived from aerial photographs. The segment-level method had advantages but needs further improvement before it can be applied in practice
- The computers of modern harvesters produce enormous amounts of data about the harvested trees. These data can be used to map the structure of the forest (or the previous forest) in detail. **Jussi Rasinmäki** and **Timo Melkas** used a harvester with a GPS to map the position of the trees and the spatial variation in volume in a stand. The results can be used as field reference data for remote sensing methods or field inventories.

“Topping” – an interesting alternative for pre-commercial thinning

In “topping” stems are cut at a significant distance above the ground (70–170 cm), instead of at their base. The topped secondary stems may promote higher quality in the main stems. Furthermore, topping may also help reduce the cost of future thinnings.

Topping was one of the methods studied in the recently finished SNS project “New and efficient pre-commercial thinning: synthesis of biology, technology and economy”, a joint Swedish-Danish-Finnish project.

Silvicultural results

The silvicultural part of the project included studies on birch (Sweden) and beech (Denmark). The results showed that topping significantly increased main stem quality (leading to fewer forks, straighter stems, higher live crown height etc.), compared to traditional pre-commercial thinning where secondary stems were cut just above the ground. However, secondary stems had higher survival rates after topping compared to traditional pre-commercial thinning.

Technical studies

In Sweden, the performance of three prototype motor-manual saws and a fully mechanised prototype for topping was

The topped stems are cut at the height of 0.7–1.7 m. Pre-commercial thinning in this way is less costly than with traditional brush saws. The “stump” can survive for a period and help to promote higher quality in the main stems. Photo: Daniel Ligné

compared to that of a conventional brush saw. Despite having a less powerful engine, a motor-manual pole saw prototype proved to be a competitive alternative to the brush saw, in terms of both time consumption and damage to the residual stand. The mechanised prototype seemed to be a competitive alternative in high diameter and dense stands.

Economy

In Finland, studies were performed to determine the overall economics of manual and mechanized pre-commercial thinning. The results showed that a pre-commercial thinning generally improved profitability, and in some cases even thinning by the mechanized methods was more profitable than avoiding thinning, even though they were expensive.

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- short
- relevant to the Journal
- interesting for the readers.

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