

## From the scientific editor:

# From cell to sale

*Welcome to yet another volume, the seventeenth, of Scandinavian Journal of Forest Research, in which we continue the tradition of offering a journal open to a broad spectrum of forest research, including both theoretical and applied aspects. This issue, for instance, covers topics ranging from the carbon uptake in stomatal cells to maximising financial returns when handling forestry's end products.*

### ● **Stomatal conductance.** First, **Ian Strachan** and **JH McCaughley**

present basic models describing how stomatal conductance is related to solar radiation, air temperature, time and vapour pressure in black cottonwood: models that contribute to our understanding of the behaviour of fast-growing trees, especially those growing in marginal environments, where plant-environment interactions are particularly important.

### ● **Predicting vole damage.** Voles can

cause severe damage to forest trees and seeds during peak years, and there has long been a desire to predict exactly where serious damage will occur. **Lennart Hansson** concluded, after extensive field research, that this is difficult. However, there are some interesting relationships between vole density and habitat and landscape variables.

### ● **Global change may increase forest growth.**

The likely impact of climate change on forest production is reported by **David Zheng** and co-workers. They applied a biomass production model and validated it using real data from south-eastern Norway. Increased temperature did not in itself cause any dramatic increase in net growth, but if CO<sub>2</sub>-content rose simultaneously, the net production could be almost 50% higher!

### ● **Management of rot-affected stands.**

A forester who discovers butt rot in his young spruce stand faces a tough decision. How should he manage the stand if he wants to minimize the spread of the rot and maximise profitability? **Timo Möykkynen** and **Jari Miina** tackle the problem by optimising the number, types and times of thinnings and time of cutting. They found that optimal management depends on the initial level of butt rot.



● **Seedlings and light.** The complex interactions between seedling behaviour, light and temperature have long been studied, but there is still a lot to learn. **Inger Sundheim Pløistad** and **Grete Patil** have concentrated on how to avoid spindly seedlings of Norway spruce. They found that alternating day and night temperatures was not effective, but extending day length with light rich in far-red wavelengths was promising.

● **Karelian forests under split management.** Consider a forest area that has been under the same management for centuries. Suddenly it is divided by a national border into two parts: one intensively managed and one very heavily utilised. What are the effects on the remaining stands after half a century? **Juha Jantunen** and his colleagues studied this question in the “real-life” experiment on the two sides of the Russian border in Karelia. They found that the Russian stands were more heterogeneous and contained more dead trees, a result of the lower-intensity management compared to Finnish Karelia.

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### ● Public opinion in forest planning.

Public opinion is becoming increasingly important in forest planning. But handling and drawing conclusions from the diverse, often unstructured, information that can be collected from the public is difficult. **Lena Hytönen** and her coworkers present a method to condense the diverse qualitative information generally obtained into a package that can be used directly for forest planning.

● **Intrinsic properties.** The inner parts of the logs determine the value of the end products from forests. Knots have a major influence on their value, and they are one type of feature that can be detected by computer

tomography. **Urban Nordmark** presents a method for identifying the knots in images of logs using Artificial Neural Networks. The method seems to work well on the studied material, logs from young Scots pine.

● **Optimisation.** Computer power also plays a major role in the paper by **Christine Todoroki** and **Mikael Rönnqvist**. They present a tool for optimising cutting in a sawmill that considers not only the maximum output for each log, but also the variable demands of the market. The system was tested and found to be efficient – fewer logs were required to meet the customers' changing requirements.

### ● Value-added sawmill production.

The final paper in this issue is even closer to market issues, assessing which strategies towards value-adding activities give the highest returns in the sawmill industries. **Anders Roos** and colleagues analysed Swedish sawn wood industries. Almost half of the sawmills did not have any value-adding activity at all, and these mills also had the lowest profit margins. The authors showed that profitability increased when value-adding activities (such as planing, drying to order, grading or laminating) were applied.

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## Northern forests carbon sink

**Forests in Europe, Russia and America accumulated nearly 700 million tonnes of carbon a year during the 1980s and 1990s. This is equivalent to about 12% of annual global carbon emissions from industrial activities. European forests soaked up 120 million tonnes of carbon a year, corresponding to about 11% of Europe's annual emissions. These figures come from a study carried out by NASA. The researchers used satellite data combined with forest inventory data.**

While sophisticated ground-based forest inventories are routinely done in some countries, vast tracts of forests in large countries such as Canada and Russia are rarely inventoried because of their remoteness. "This study suggests the possibility of surveying forests from space and making wood volume maps across a wide variety of forests" said **Ranga Myneni** of Boston University.

The researchers combined information on forest greenness obtained from sensors on satellites with wood volume data from forest inventories. The results were transformed into high-resolution maps of carbon stocked in about one and half billion hectares of northern forests located

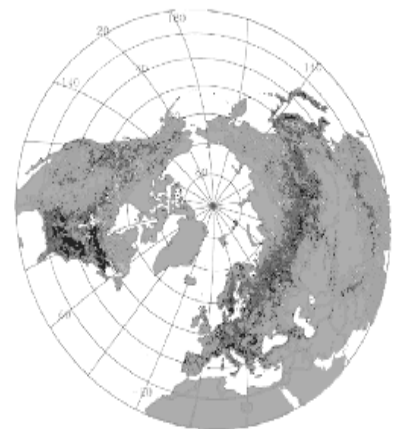
above the 30th parallel.

By comparing the carbon stock maps of the late 1990s and early 1980s, the researchers were able to identify forests accumulating carbon, and forests losing carbon. The researchers report that about 61 billion tonnes of carbon is contained in the wood of these northern forests.

The American and European forests contained more carbon per unit area than their Canadian and Russian counterparts (56 versus 41 tonnes per hectare). Among the European countries, Austria, France and Germany had notable stocks.

The rate of accumulating, in tonnes carbon per hectare per year, varied from country to country during the

**Changes in carbon pool, tons C/ha/yr 1980s to 1990s**



sources | sinks

1980s and 1990s. It was highest in Europe (0.84) and America (0.66), and lowest in Canada and China (0.29), with intermediate values for Russia (0.44).

The researchers do not know whether these forests will continue to accumulate carbon in the future or release it at some point. That is why it is important to continue monitoring them, from both space and the ground.

Source: EFI. [www.efi.fi](http://www.efi.fi)

## ***News in brief from the SNS***

# The SNS moves to Norway

The Nordic Forest Research Co-operation Committee (SNS) has elected a new chairman, Olav Hepsö, Section Manager at the Research Council of Norway.

The chairmanship of the SNS rotates between the Nordic countries, and Norway will carry this responsibility during 2002–2005.

The SNS secretariat will also be based in Norway during this period. The new secretary is Olav Gislerud, Adviser at the Research Council of Norway.



***Olav Hepsö, the new chairman***



***Olav Gislerud, the new secretary***

### ***New address for SNS***

From January 1<sup>st</sup>, 2002, the address of the SNS will be:

The Nordic Forest Research Co-operation Committee (SNS)  
att: Olav Gislerud

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## New grants

The SNS has decided to finance four new research projects from 2002. The four projects were selected after evaluating 13 project proposals. The new projects are:

- **Development of wood fibre composite materials (2002–2004).**

*Project leader:* Kristofer Gamstedt, Royal Institute of Technology, Stockholm

- **Role of fine roots in carbon dynamics of forest soils (2002–2004).**

*Project leader:* Heljä-Sisko Helmisaari, Finnish Forest Research Institute, Vantaa

- **Control of apical growth cessation and cambial activity (2002–2004).**

*Project leader:* Rishikesh P. Bhalerao, Swedish University of Agricultural Sciences, Umeå

- **Plant protection by beneficial soil organisms (2002–2003).**

*Project leader:* Gudmundur Halldorsson, Iceland Forest Research Station, Mógilsa

The SNS has also evaluated 15 grant applications concerning conferences, workshops and other meetings. Support from the SNS will be given to 12 of these networking activities during 2002.

# Wood-preservation with sugar-cane residue

In Norway, an alternative method of wood-preservation is being tested. The wood is treated with a natural chemical, a residue from sugar-cane. The chemical reacts with the wood so that the rot-fungi no longer recognise it as "food". The chemical also keeps the wood dry, by deactivating OH-groups in it, making it less hygroscopic.

The chemical was originally isolated in Canada, and is now being developed by

a Norwegian company.

In one experiment, sugar-cane-treated wood stored in soil for a year lost only 3 to 7% of its substance, compared with 2 to 16% for traditional CCA-preserved wood and 50 to 73% for untreated wood.

The chemical penetrates the sap-wood of pine, but not the heartwood. This is no real problem, for this application, since the heartwood has good natural preservatives. But since the

sugar-cane preservation colours the wood brown, you get an off-putting variation in colour between sapwood and heartwood.

*Source: Skogbruk 11/2001*



# Mycorrhiza inoculated in Icelandic seedlings



Larch seedling with ectomycorrhiza. Photo: Jørgen Hajek

In Iceland, seedlings are regularly treated with mycorrhizal fungi. Experience shows that the treatment reduces plant losses, but has only a marginal effect on the seedlings' growth. This message was presented during the Nordic Seed and Plant Council conference, recently held in Iceland.

In Iceland, most of the trees planted are of foreign species. Moreover, many soils are sterile due to volcanic activities. Therefore, there are no appropriate mycorrhizal fungi in the soils.

During the conference, the French researcher Jean Garbaye from Nancy Research Centre discussed his research. According to him, the mycorrhizae have a number of beneficial effects:

- increasing the uptake of water and nutrients
- protecting the roots of the seedlings from pathogens
- increasing the longevity of the fine-roots.

In France, four nurseries are using mycorrhiza in the production of oak and Douglas fir. The mycorrhizae increase growth and reduce the need for fertilizer and fungicides in the nursery, he said. After planting, the seedlings take up nutrients more efficiently, and grow faster, which gives them significant advantages over the competing vegetation.

Source: PLANTaktuellt nr 4 2001.

## Stump treatment against root rot –European survey

Poland, Britain and Sweden carry out the largest stump-treatment operations against root rot in Europe, according to a questionnaire survey recently conducted by SkogForsk, Sweden. Altogether, the nine countries taking part in the survey treat stumps on a total of 210,700 ha a year.

Although stump treatment is usually done in conjunction with thinning, some countries also perform the treatment during final felling.

Norway spruce (*Picea abies*) and Sitka spruce (*Picea sitchensis*) are the most frequently treated species—

except in Poland, where treatment is confined almost exclusively to Scots pine (*Pinus sylvestris*).

The most commonly used agent for preventing root rot is the fungus *Phlebiopsis gigantea*, followed by urea. Borate accounts for only 2% of the treatments, and is used mainly in Sweden.

The level of mechanization is generally high, although all treatment in Poland is done manually.

Finland, France, Poland and Sweden all predict their levels of stump treatment will increase in the future, whereas Britain expects the scale of

Area treated annually, hectares	
Denmark	5,500
Finland	12,000
France	300
Germany	0
Great Britain	69,000
Ireland	18,500
Norway	400
Poland	70,000
Sweden	35,000
<b>Total</b>	<b>210,700</b>

operations to decline. The other countries believe that their treated areas will remain largely unchanged.

Source: Resultat no. 15 2001. SkogForsk. Sweden

## Less interest in “Svanen”-ecolabel



In June 2001, the Nordic ecolabel Svanen introduced new criteria for paper. This has led to a dramatic decrease in the number of licensed paper qualities—from over 1,000 to only 100 today. This is partly due to changes in the rules. At least 15% of the wood-fibre should now come from certified forests—or 50 % from recycled paper. There are also new rules for energy use and stipulations that the chemicals used should be biodegradable.

Many paper mills have turned to other environmental-certification systems for their paper; e.g. EMAS and ISO 14001.

## Wood more hygienic than plastic

After four weeks, there were more bacteria in plastic pallets than in wooden ones, although the plastic pallets were regularly cleaned, unlike their wooden counterparts. This was a surprise finding in a study in a meat-producing company.

In the food-processing industry, there is a general trend away from wooden packaging to other materials, mainly for hygienic reasons. But this may be counterproductive, according to a number of European studies highlighting the natural antiseptic properties of wood.

In another study, pine-wood was found to be most effective for inhibiting the growth of

bacteria, followed by oak, larch, spruce and poplar. In this study, plastic (polyethylene) was less effective in hampering bacteria.

Source: Skogeieren 12/2001 and www.trae.dk

*Wooden cutting-board, obviously a hostile place for germs.*



## Porest sinks not included in Swedish CO<sub>2</sub>-agreement

Sweden has committed itself to a 4% reduction in CO<sub>2</sub> by the year 2010 compared with the level in 1990. This is the main theme in a new government bill.

These are to be real domestic cuts, above and beyond any reductions attributed to sinks or mutual commitments with other countries (so called flexible mechanisms).

According to the Kyoto-protocol and the following EU-agreements, Sweden

was allowed to *increase* its CO<sub>2</sub>-emissions by 10%. This was due to the big CO<sub>2</sub>-sink in the growing stock in Swedish forests, and the relatively low CO<sub>2</sub>-emissions per capita in Sweden compared with other European countries.

But now the Swedish government has decided not to make use of these favourable considerations, and to reduce real CO<sub>2</sub>-emissions by 4%.

*The growing Swedish forest stock is not included in the proposed CO<sub>2</sub>-goal for Sweden*



## Porest gene-resources given high priority in Denmark

The Royal Danish Veterinary and Agriculture University has created a new professorship in forest gene-resources.

The new appointee (Erik Dahl Kjaer) will work with 20 different domestic species of trees and shrubs. The objective is to learn more about their gene resources—and how they are affected by management. The project will inventory existing populations in Denmark, to identify hardy and resistant lines.

The project will involve co-operation with other Danish institutions, such as The Arboretum, and in the future many seed-sources will be used simultaneously in field experiments, gene-bank and breeding populations.

Source: Skov & Landskap Nyt No. 4 2001

*Blackthorn is one of the species whose gene-pools will be investigated in the new Danish project.*



# 22 excursions and one congress

Forestry professionals of the five Nordic countries have gathered at four-year intervals for over 50 years at Nordic Forest Congresses. In June 2002, Finland hosts the next Congress. The theme is "The Forest & Its Many Values".

Twenty-two different top-quality excursions are being organised, to run concurrently from June 16 to 18, to various parts of Finland and adjacent countries. A number of issues will be covered: from arctic forestry in the north, to biofuel harvesting, logistics and forestry communication.

Following the excursions there will be a General Session of Congress in Helsinki, June 19.

The Nordic Forest Congress has attracted increasing numbers of guests and partners from outside the Nordic regions. Some of the congress excursions will be conducted in English and speeches delivered at the General Session will be provided with English interpretations.

More info: <http://www.smy.fi/nsu/en/>



**June 16–19 2002**

## Leonardo da Vinci-vision comes true in Norway

2000 pine trees were used when one of Leonardo da Vinci's dreams was realised after almost 500 years, in Akershus, Norway. The architect, Vebjørn Sand, took an old drawing produced by Leonardo as the starting-point for a new bridge over the E18. The bridge has a span of 110 metres, and is made out of glue-laminated wood supplied by the Norwegian wood-processing company Moelven.

Source: *Skogseieren* 12/2001



## Estonian wood in NHL

An Estonian company, Viisnurk, has won an order to deliver ice-hockey-sticks to the NHL. The sticks are made of Estonian ash and birch. The company was started in 1998, and last year they sold 43,000 sticks.

Source: *Skogsbruket* 11/2001



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

**Examples:** comments on papers published in the Journal, views on ongoing research, trends in research policy, opinion about forestry practice etc.