News and Views

from Nordic Forest Research SNS

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Fibres, diseases, adaptation. Many of the research questions are common to forestry, agriculture and horticulture. SNS and NKJ supports five new cross-sectoral networks. Photo Mats Hannerz and Wikipedia commons.

Interdisciplinary networking will strengthen the Nordic bioeconomy

What do apple orchards and Christmas trees have in common? They can both suffer from *Neonectria* canker. And, they are representatives of the Nordic bioeconomy. Many challenges related to climate change, diseases or biomass production are common to horticulture, forestry and agriculture. This is what has motivated SNS and NKJ to progress with five new interdisciplinary networks.

SNS (Nordic Forest Research) and NKJ (Nordic Joint Committee for Agricultural and Food Research) launched a call for cross-sectoral networks this spring. Five were granted funding. Four are new, while one (FiberTies) is a continuation of an existing network established in 2015.

The overall aim is to promote international and cross-sectoral networking between researchers from the agricultural, horticultural and forestry sectors. An important component is also the transfer of knowledge to practice, thus all networks collaborate with stakeholders representing the users of the research results.

Read more on SNS and NKJ webpages:
www.nordicforestresearch.org
www.nordicagriresearch.org

5 new cross-sectoral networks

- *Neonectria* cankers
- Genes4Change
- Biocontrol
- FiberTies
- BiowiseTrans

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Networks, cont.

Neonectria cankers on trees

This network tackles the problems with cankers caused by the three pathogenic *Neonectria* species active in the Nordic countries.

Neonectria ditissima causes major problems in apple orchards, affects young beech stands, and attacks a number of other broadleaved trees. N*eonectria neomacrospora* kills true firs (*Abies* spp.), used for bough production, Christmas trees and timber. The third, *N. fuckeliana* causes top dieback in Norway spruce, creating problems in Christmas tree production and timber stands.

The network will arrange a meeting in 2017 and a symposium in 2018 with the aim of exchanging and drawing together knowledge about the current situation with *Nenectria* cankers, and identifying research topics of mutual interest to both the forest and the horticultural sector. A review paper will also be published.

Network title: Neonectria *cankers on trees – meeting changed climatic conditions and increased problems in Nordic horticulture and forest production by interdisciplinary networking*.

Main applicant and contact: *Dr Jorunn Børve, Norwegian Institute of Bioeconomy Research - NIBIO, Norway.* *jorunn.borve@nibio.no*

The application: "The *Neonectria* species in question are closely related, and it is thus reasonable to believe that good management strategies obtained for one of the pathogens may be applicable for the other two." The image shows *Neonectria* canker on apple. Photo Cherubino, Wikipedia commons

Genes4Change

This network will focus on the genetics role in meeting climate change.

Climate change will bring challenges for growing crops both in the agricultural and forestry sectors. Increased temperatures and longer growing seasons may enable higher productivity, but may also lead to maladapted growth rhythms of crops and trees. Adaptation, mitigation and breeding for climate change require an understanding of natural selection, the molecular basis of the adaptive traits, as well as modelled predictions of climate.

So far, Nordic cooperation in forest genetics has been very successful and resulted in large research programmes financed by the EU. By widening collaboration across disciplines, Nordic teams become even stronger.

The network will bring together researchers, practical breeders and end users of genetic materials from the forestry and agricultural sectors. Meetings will be organised with the aim of identifying knowledge gaps and converting knowledge into practice.

Network title: *Genes4Change - Adaptation, mitigation and breeding of trees and crops for future climate*.

Main applicant and contact: *Professor Katri Kärkkäinen, Natural Resources Institute - Luke, Finland.* *katri.karkkainen@luke.fi*

Biocontrol

This network will promote transfer from basic research results to commercially viable biocontrol solutions.

Biological control is an essential component of integrated management of pests, pathogens and weeds, but much of the research on biocontrol is never converted into practical solutions. Despite more than 80 years of research on beneficial microbes, only 14 biological control agents had been registered for use across Europe by 2016. Part of the explanation is the lack of dialogue between research and commercial actors.

The network will assemble researchers from both forestry and agriculture and promote academia–industry collaboration. Two meetings, one in December 2017 and a second in September 2018, will be organised.

Network title: *Dialogue Biocontrol – Improving utilisation of biocontrol research for practical plant protection solutions in agriculture and forestry.*

Main applicant and contact: *Dr Ramesh Vetukuri, Swedish University of Agricultural Sciences – SLU,* *ramesh.vetukuri@slu.se*

FiberTies

The FiberTies network has already been funded by SNS-NKJ in 2015-2016, and it will continue its work on utilising plant fibres from the forest, agricultural and food sectors.

Plant fibres have a potential to be used in a large number of applications, in the building, textile and packaging industries. Recycling and reuse of biobased fibres is also an important contribution to a circular economy.

The network has recently applied for funding for cross-sectoral projects. In the current period, it will continue with new applications for collaboration. A first open symposium will be held in Denmark in autumn 2017. FiberTies will then assemble players that represent the whole value-chain, from primary producers to consumers.

Network title: *FiberTies – The use of fibrous materials from biomass*

Main applicant and contact: *Dr Anne Christine Steenkjaer Hastrup, Danish Technological Institute - DTI,* *acha@dti.dk*

Webpage: *www.fiberties.dk*

Networks, cont.

BiowiseTrans

The aim of this network is to study and propel the transition towards a new primarily land and biomass-based bioeconomy.

BiowiseTrans is led by Nordregio, a research centre for regional development and planning established by the Nordic Council of Ministers.

The basic idea is that transformation of the current economy into a new bioeconomy needs changed institutional frameworks at regional and national level. Place-based knowledge and other types of resources vary across regions and need to be considered in the transition process. The focus is on innovation and adaptation, with local stakeholders taking part in innovation processes to deliver local economic and social benefits.

The network will arrange three workshops, one each in Finland, Norway and Sweden, followed up by a conference in Karlstad, Sweden, in November 2018.

BiowiseTrans will also produce research proposals and an application for a joint PhD programme.

Network title: *BioWiseTrans - Advancing the bioeconomy transition in the Nordic Region.*

Main applicant and contact: *Karen Refsgaard, Nordregio, Sweden, karen.refsgaard@nordregio.se*

50 years of plant science in Umeå

In August 2017, plant science in Umeå in northern Sweden will turn 50. The anniversary will be celebrated with a three-day long symposium looking back at its history as well as forward to the future.

The current Umeå Plant Science Centre (UPSC) is an umbrella unit hosting two departments at two different universities. The Department of Plant Physiology (commonly called *FysBot*) was founded in 1967 at the then newly created Umeå University. Ten years later, the Department of Forest Genetics and Plant Physiology (*GenFys*) was established at the Swedish University of Agricultural Sciences (SLU). SLU was founded in 1977 out of the agricultural, forestry and veterinary university colleges, the Veterinary School at Skara and the Forestry School at Skinnskatteberg. Forest researchers were relocated from their old premises in Stockholm to Umeå, Uppsala and Garpenberg. It was decided to site GenFys in Umeå, which was to become the new centre for the Forest Faculty.

The history of the two departments is remarkable. Starting from almost nothing 50 years ago, they now form a world acknowledged centre for forest biotechnology. Umeå Plant Science Centre was formally established in March 1999. The two departments had undertaken high-quality research in molecular biology, hormone physiology and plant genetics. Although separately located at the Umeå campus, they had a fraternal relationship and strong research cooperation. The idea to merge the departments had come up back in the 1980s, but it took over a decade to become a reality. Soon after the formation, all researchers were able to move to the newly reconstructed building at Umeå University Campus.

Today, the Umeå Plant Science Centre hosts some 200 researchers of 47 different nationalities. Over the years, several “breaking news” stories have originated from the unit, many topping the headlines in Science and Nature. Examples include the presentation of the full genetic sequence of a spruce tree in 2013. This was the first full sequencing of a conifer, and the largest genome ever sequenced. The Norway spruce had at least 29,000 genes, which is more than a human.

Other examples are the discovery of the flower regulating genes, and the finding that all plants take up amino acids from the soil. The latter led to one of many inventions in the portfolio of SweTree Technology, a company set up to commercialise the research results.

Read more: *www.upsc.se*

The entire genome of Norway spruce is known trough the work at UPSC.
Photo Mats Hannerz.

Populus, a model tree for biotech at UPSC.
Photo Mats Hannerz.

Stefan Jansson, FysBot head.
Photo Mats Hannerz.

Shortcuts from Nordic forest research

Sweden

SLU celebrates 40 years

The Swedish University of Agricultural Sciences was formed in 1977. The 40-year anniversary will be celebrated with several activities during the year.

Read more: *www.slu40.se*

Finland

Record hunting of raccoon dogs

In 2016, over 200,000 raccoon dogs were successfully hunted in Finland. The raccoon dog is considered non-native. It originates from Southeast Asia, and has entered Finland from Russia over the last few decades.

Read more: *www.luke.fi*

Sweden

The last bilberry forecast

The National Forest Inventory has, since 2003, made predictions of bilberry production in Sweden, based on an inventory of flowers and immature berries in permanent plots. However, 2017 will be the last year, due to reduced funding. The berry production has, over the 14-year period, increased somewhat, but the variation is large between years. Longer time series are needed for establishing trends.

Read more: *www.slu.se*

Finland

Forestry statistics expand

New sectors are being included in the forestry statistics package produced by the Natural Resources Institute Finland (Luke). These include forest biodiversity, harvesting and long-distance transportation of roundwood, forest sector labour force, energy produced by different methods, and the forest industries. Each new sector has its own homepage in Luke's online statistical services.

Read more: *www.luke.fi*

Norway

Expert panel gives advice on criteria defining good ecological status

The Ministry of Climate and Environment in Norway has assembled an expert panel to develop a technical system for the determination of good ecological condition. The system should be based on scientific indicators. Their first report was published in spring 2017. Professor Anne Sverdrup Thygeson is one of the experts, responsible for woodland issues.

Good ecological condition is defined as only small deviations from intact nature. The panel acknowledge that many existing systems, such as the red list of species, Nature in Norway inventories, and the Nature Index, are valuable to build on. However, more monitoring is needed for all ecosystems. There is a need for area-representative, extensive monitoring based on cost-effective, but well-validated, indicators.

Source: *Nybø, S. & Evju, M. (red) 2017. Fagsystem for fastsetting av god økologisk tilstand. Forslag fra et ekspertråd. Ekspertrådet for økologisk tilstand, 247 s. https://www.regjeringen.no/no/ dokument/ rapportar-og-planar/ id438817/.*

Staying evergreen or shed the leaves, a tricky choice in the tropics. Photo Mats Hannerz.

Call for SNS networks

SNS has announced a new call for network collaboration in **wood science and technology**, including wood processing and utilisation. Each network can apply for approximately 100,000–250,000 SEK, and 50% of the total budget must be self-financed.

Deadline for applications:
September 11, 2017.

Read more: *www.nordicforestresearch.org*

Sweden

Climate change may give leaf-shedding trees in the tropics an advantage

Trees in tropical dry forests have to cope with periodic dry spells, which may become even more severe with climate change. A researcher at SLU, Giulia Vico, together with colleagues has compared two strategies employed by the trees – staying evergreen or dropping leaves over the dry period. Both of the strategies entail costs. The trees that drop their leaves have to form new ones when the dry period ends and they will be unable to photosynthesise for a while. The evergreen trees will lose carbon through respiration, and they also have thicker leaves that cost more carbon to build up. The researchers showed that it is more beneficial to remain evergreen when the wet season is long. As the dry periods become longer and more intense, it will be more beneficial to shed leaves.

The study is published in Environmental Research Letters.

Read more: *www.slu.se*

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More info about SNS:

www.nordicforestresearch.org

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