



norden

Nordic Forest Research
Cooperation Committee - SNS

Project no: SNS-99

SNS, Skogsforskningsinstitutet Metla
Jokiniemenkuja 1 , P.O.Box 18
FI-01301 Vantaa, Finland
E-post: sns-sekretariatet@metla.fi
Tel: +358 10 211 2213

FINAL PROJECT REPORT

Please notice that the size of text sections in the form can be adjusted if needed.

The length of the final report should not exceed 5 pages.

1. Projekt titel	En permanent karteringspopulation för grans genomik
2. Title of project	A permanent Mapping Population for Genomics of <i>Picea abies</i>
3. Project leader /coordinator (name, address, telephone, telefax. e- mail)	Martin Lascoux Program in Evolutionary Functional Genomics Evolutionary Biology Centre Uppsala University Norbyvägen 18D 752 36 UPPSALA
4. Time schedule	The project started 1 /01 2006 and ended 31/12 2008
5. Project cost	SNS-grant: 1,200,000 NOK Total project cost: 1,200,000 NOK
6. The purpose of the project/main problems/hypotheses addressed	The purpose of the project was the establishment of a permanent mapping population for genomics of <i>Picea abies</i> and its use for the identification of polymorphisms associated with adaptive traits, in general, and more specifically, in the short term, with phenology. The initial material was collected in a previous EU-funded project, Treesnips, and established in a greenhouse in Finland. So the phenology of the plants had already been evaluated.

<p>7. Brief description of the research plan and of possible larger deviations from the plan</p>	<p>Most of the SNS-funding was devoted to the establishment and measurement of the population, following the outlined plan Year 1: Move of the population from Finland to Sweden and establishment of the population. Measurement of phenological traits and height. Year 2: Measurement of phenological and growth traits. Year 3: Measurement of phenological and growth traits. We did not take any measurements the first two years, as plants were probably strongly affected by the plantation. Measurements were, however, taken the following two years. In parallel we have, used other funds to identify candidate genes for budset and develop Single Nucleotide Polymorphisms and we will soon be able to build a 1536 SNPs Illumina chip. We plan to genotype part of the association mapping population in the fall. The focus will be on populations from the Northern part of the Picea abies range as it comprises most of the variation in budset.</p>
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8.
Results
(max 2 pages)

See attached file.

<p>9. What advantages has been gained by the Nordic collaboration (i.e. by the cooperating partners, use of the project results)</p>	<p>Most of the efforts so far has been devoted to the establishment and maintenance of the mapping population so that less physiological measurements have been taken on the plants at that stage than initially planned. However, data are currently gathered on the population that will be used for a joint analysis. The project has already benefited from the specific experience of the different partners. In particular the know-how in handling and measuring large number of plants of the two partners most involved in breeding activities has been instrumental, especially in the early stages of the project.</p>
<p>10. Publications and other communication activities (please list scientific reports, more popular reports and other communication activities)</p>	<p>There has not yet been publication directly related to the association mapping population but publications are planned for 2010 once the plants will have been genotyped. There has however already been publications associated to the development of knowledge needed to analyze the association mapping population.</p> <p>Yakovlev, IA, Asante DKA, Fossdal CG, Partanen J, Junttila O, Johnsen O. Dehydrins expression related to timing of bud burst in Norway spruce. <i>Planta</i> (2008) 228:459–472</p> <p>Kvaalen H, Johnsen O. Timing of bud set in <i>Picea abies</i> is regulated by a memory of temperature during zygotic and somatic embryogenesis <i>New Phytologist</i> (2008) 177: 49–59</p>
<p>11. Project summary (about 1/3 page) with main emphasis on results for possible use in the News & Views section of Scandinavian Journal of Forest Research</p>	<p>Association mapping is today one of the main approaches used to identify genomic area responsible for variation in complex traits and international efforts are under way to establish and genotype association mapping populations in the most economically important forest tree species. A <i>Picea abies</i> association mapping population based on a population previously established during an EU project and based in Finland and start to do phenotype and physiological measurements and to genotype individuals was established. Some 8000 seedlings of Norway spruce were moved to Sweden and installed in a field experiment South of Uppsala (Rölunda). Simultaneously, a smaller replicate experiment was retained in Finland. Vitality and budburst were assessed three times in the spring of 2008 and two times in the spring of 2009 in the field trial at Rölunda. The termination of growth was also assessed for some populations in the autumn 2008. The survival was 73% in the spring of 2008. Preliminary analyses show a large variation in budburst between populations, but also between families within populations. Physiological measurements (freezing tests) will be also done and part of the population will be genotyped at hundreds of Single Nucleotide Polymorphisms using a recently developed genotyping assay.</p>

12. Date and signature	Date: 2009-06-07 Signature of project leader/coordinator
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