

Final report for SNS research projects 2025-2027

Submit the report to sns@slu.se by 24:00 CET, 1st of March, 2028, at the latest.

The report should not exceed 3500 words (including words in the template).

Please adjust the size of the box according to the length of your answer.

1. Project title:	Catching up with climate change by shortcuts in breeding: Joint Nordic efforts to prove the concept of Breeding without Breeding.
2. Project code:	SNS-129

3. Project coordinator:	M Rosario García Gil
Email:	m.rosario.garcia@slu.se
Institution:	Forest Genetics and Plant Physiology

Activity report

4. Provide a project summary for the whole project period, including: a) The purpose of the project/main problems/hypothesis addressed – The project main goal has been to develop cost-effective molecular marker tools for large scale selection and to proof- test a cost effective game-changing tree breeding strategy that overcomes the limitations of conventional breeding. BWB approach potentially accelerates forest tree breeding by operating directly on commercial forests (Lstiburek et al. 2017). b) A short description of the main activities of the project - (i) to select a set of well-performing molecular markers and development of a joint low-cost genotyping platform for Scots pine, (ii) pedigree reconstruction of open-pollinated progenies, and (iii) conduct a proof-of-concept study to test the feasibility of BWB. c) Achieved targets. - All activities have been conducted. We are working with the first manuscripts. e) Did the network develop and deliver as planned? - After a first delay with the field work which required of two field work seasons instead of one, we managed to conduct all the activities planned.

5. List the published outputs achieved as a consequence of the project (peer-reviewed articles, other publications)

In progress

6. List other practical outputs of the project (websites, policy recommendations, conferences, scientific meetings, large-scale project applications, research training etc)

- Poster at GCR Quantitative Genetics Conference, Italy, 2025. by SLU partner
- Novo Nordisk application 2025, lead by SLU partner
- Scientific meeting with Skogforsk (Sweden), lead by SLU partner
- Presentation of BWB-SNP project to Forest industry in the context of "More seed orchards" excursion 22/5
- Presentation of BWB-SNP project to Troedssonfondens styrelsemöte, 22/9
- Presentation of BWB-SNP project to Stora Enso, 22/10
- Presentation of BWB-SNP at the conference "Tolerant tree"/Evoltree, Denmark, 22/8
- Attendance to SNS anniversary event in Alnarp.
- Outreach activities: Twitter, LinkedIn posts
- Steffenrem, Arne. Experiences using Lidar-drones for phenotyping and SNP genotyping in Norway. Evoltree/TollerantTree; 2022-08-24
- Steffenrem, Arne. Management of forest genetic resources under climate change; FORGENRES. Møte med TACR og Forskningsrådet; 2022-09-29
- Steffenrem, Arne. Skogplanteforedling, starten på ny produksjonsskog. Forsknings- og administrasjonsavdelingen LMD; 2022-11-09
- Steffenrem, Arne. Teknologi i skogplanteforedlingen. Gjeste forelesning ved Hamar Katedralskole; 2022-04-08
- Steffenrem, Arne. Breeding-without-breeding – ny metode i furuforedlingen. NordGen Temadag "Skogkultur – mer enn gran"; 2024-02-14
- Steffenrem, Arne; Kjos, Mari. Tree breeding in Norway. North West Tree Improvement Coop annual meeting; 2024-10-17
- Steffenrem, Arne; Odstrcil, Milo; Tyczynski, Gwidon; Kjos, Mari; Solvin, Thomas Mørtvedt. Practical experiences with phenotyping, genotyping, kinship estimation and selection for BWB in Scots pine and Norway spruce. Landscape Breeding: A new paradigm in forest tree management; 2023-01-17

7. How and within which areas was the project beneficial for the Nordic region (Denmark, Finland, Iceland, Norway, Sweden and the autonomous areas of the Faroe Islands, Greenland and Åland Islands)?

In the area of forest breeding and conservation as we have delivered prove that an alternative method to traditional breeding cycle is possible in conifers to accelerate selection without the need to induce early flowering.

Participation

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8. Number of participants involved in the project activities

(Please adjust the table with countries to match your project)

Country	Early-career researchers/ PhD students	Senior researchers	Stakeholders	Others (specify)	Gender			Total
					Women	Men	Other	
Denmark								
Finland	1	1			1	1		2
Iceland								
Norway		3	3		3	3		6
Sweden	2	1	2		3	2		5
...								
...								
...								
Total								

Gender equality actions

In the beginning of the project period, you were introduced to the [gender equality guidelines](#) and asked to perform at least five points from the action step during the whole project period. Fill in the following evaluation scheme with the actions performed. It is new for SNS to introduce these gender equality guidelines to our funded projects, so SNS would really appreciate your feedback on the guidelines and how they have worked for you.

9. Evaluation scheme	
a) Outcome of completed analysis step:	During the first project meeting the group was informed about the guidelines. We looked at them together and all received the document in their emails.
b) Outcome of completed planning step:	During the first meeting, each member was asked to describe the measures they believed were required to maintain gender equality. As the project coordinator, I have not witnessed any unequal gender treatment during our meetings, and the language has been neutral. Instead, I've seen both genders contribute equally to discussions and project development.
c) Outcome of completed action steps (please list each action point performed and their outcome)	The actions have been the active encouragement of equal participation of men and women in decision-making processes, with special emphasis on encourage of young female researchers in the team to contribute to discussion, leadership, and project development.
d) How did the actions/tools work for your network:	They made the team reflect about the obvious and the less obvious about gender equality. There has not been any conflict and the gender equality actions have been well received by the team. I personally think that is still important to continue with the work actively to remind us that there is still a lot to be achieved. For example, I will encourage a slide about gender equality guidelines to be presented along with our research in international activities.
e) How could SNS provide more support to your network in the work toward gender equality:	Annual webinar on education and discussion on gender equality to enhance the implementation of actions and inform the latest/new members of the project.
f) General feedback to the gender equality guidelines:	Inspiring, useful, and important to maintain the work towards a higher equality. The text makes you reflect to the point of realizing that one can always do more to secure gender equality.

Economic report

The economic reporting should include the total received grants and costs for the whole project period

10. Received grant from SNS in total (SEK):

11. Allocation of SNS funding

Country	Partner/institution	Sum (SEK)
Denmark		
Finland		350000
Sweden		350000
Norway		345000
Iceland		
Other countries (specify)		
Total SUM		1045000

12. Costs

(in SEK)	SNS funding	Co-financing		Total
		Cash	In-kind	
Travel and accommodation	55000	15000		70000
Meeting costs	55000	6000		61000
Communication	15000	6000		21000
Salary and OH	275000		2403049	2678049
Other costs (specify)	645000		20000	665000
Total SUM (SEK)	1045000	27000	2381432	3495049

13. Economic result (deficit or surplus):

no deficit or surplus

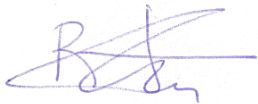
14. Optional: Comments to the economic reporting:

15. Submit a popular science piece as a separate document for dissemination in SNS' various channels with *emphasis on application of results and benefits for the Nordic society*.

Please see separate document for instructions.

I hereby declare that the above statements are true to the best of my knowledge
(Please adjust the number of signature boxes to the number of applicants)

Signature of the main applicant/project coordinator



Signature

M Rosario García Gil

Forest Genetics and Plant Physiology 2025 02 20

Institution

Date

Signature of the department head at the department of the main applicant

Forest Genetics and Plant Physiology

Institution

Date

Signature

Totte Niittylä

Second applicant's signature, place and date



Signature

Arne Stefferem

NIBIO
Institution

Date

Second applicant's signature, place and date



Signature

Tanja Pyhäjärvi

University of Helsinki
Institution

March 3rd 2025

Date

Signature	Institution	Date

Printed name		

Fourth applicant's signature, place and date		

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Signature	Institution	Date

Printed name		

Fifth applicant's signature, place and date		

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Signature	Institution	Date

Printed name		

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