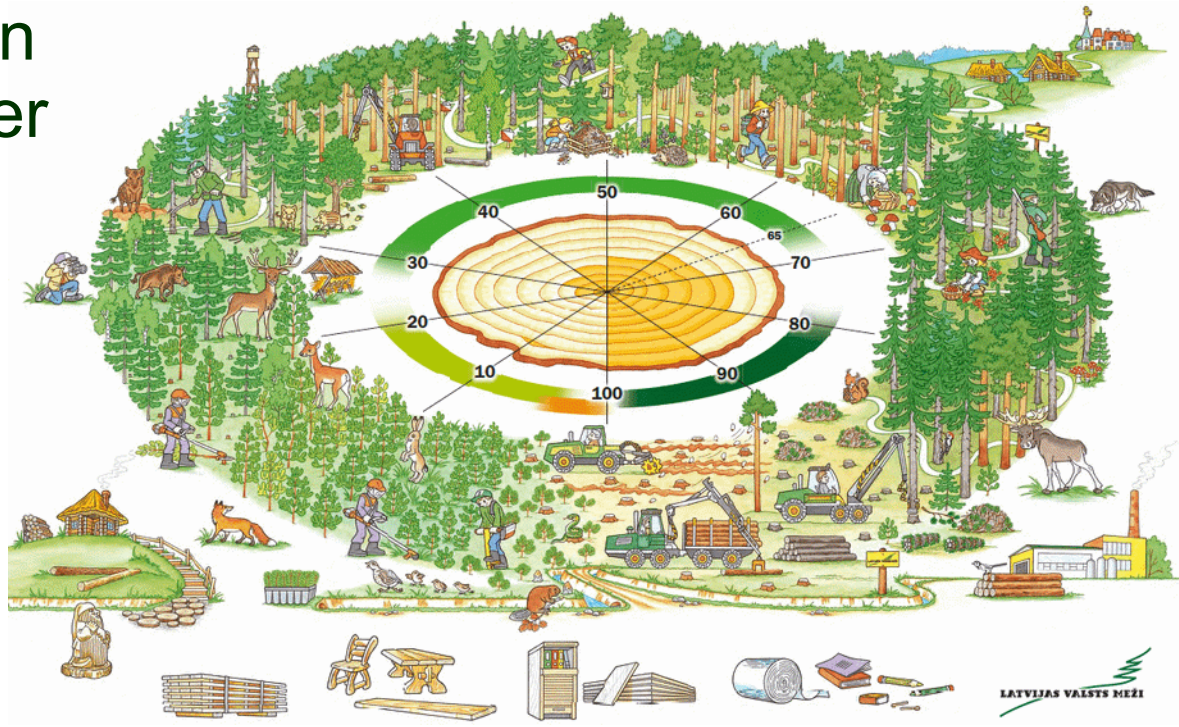
CAR: NB-NORD
Nordic-Baltic Network for Operational Research

Improved forest regeneration operations in Latvia – transfer and adaption of Nordic technologies
- **mechanized planting**



Dagnija Lazdina[1] *Karlis Dumins*[1,2], *Toms Arturs Stals*[1], *Kristaps Makovskis*[1], *Timo Saksa*[3]
[1]Latvian State Forest Research Institute "Silava", Latvia;
[2]Latvia University of Life Sciences and Technologies, Latvia
[3]Natural Resources Institute Finland, Finland

NACIONĀLAIS ATTĪSTĪBAS PLĀNS 2020
EIROPAS SAVIENĪBA
Eiropas Reģionālās attīstības fonds
IEGULDĪJUMS TAVĀ NĀKOTNĒ

Attendance of conference support Project Atbalsts LVMI "Silava" starptautiskās sadarbības projektiem pētniecībā un inovācijās" . Nr. 1.1.1.5/18/I/010

Mechanized planting

Mounds

Disc trenches

Around 30% of forests in Latvia are growing **on wet soils** where the conventional regeneration methods using disc trenchers cannot provide **satisfactory results.**

Mechanized planting (2017)

- Widely distributed method – furrowing with disc trenchers is **not always appropriate for wet forests** because furrow are flooded during spring and autumn causing decaying of planted trees.
- Lack of labor willing to do simple forest management operations and **increase of labor cost** are predictions to introduce mechanized planting on mounds in Latvia.
- **Less communication** with contractors.

FORMEC 2018 – Improved Forest Mechanisation: mobilizing natural resources and preventing wildfires September 25th -27th, 2018. Madrid, Spain

MOUNDING AND MECHANIZED PLANTING IN FOREST REGENERATION IN CHANGING CLIMATE CONDITIONS

Lazdina Dagnija, Makovskis Kristaps, Stals Toms Arturs, Dumins Karlis, Lazdins Andis

Latvian State Forest Research Institute Silava

Department of Forest Regeneration and Establishment, Tree Plantings Outside Forest Land

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Mechanized planting (2017)

M-Planter

+

MPV-600

Manual and mechanized planting was done in 6 clearcut areas:
2 wet fertile forest on mineral soil,
2 drained forest - peat layer less than 35 cm,
2 drained forest - peat layer deeper than 35 cm.

SNS Nordic Forest Research

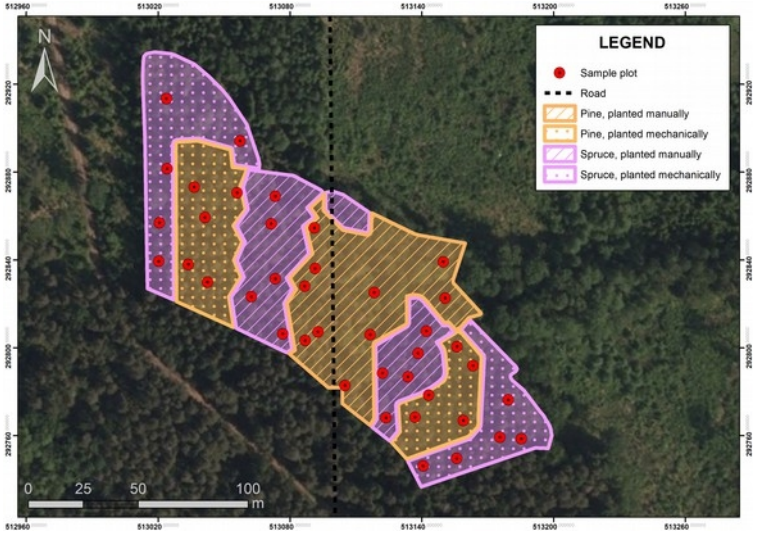
Nordic Council of Ministers

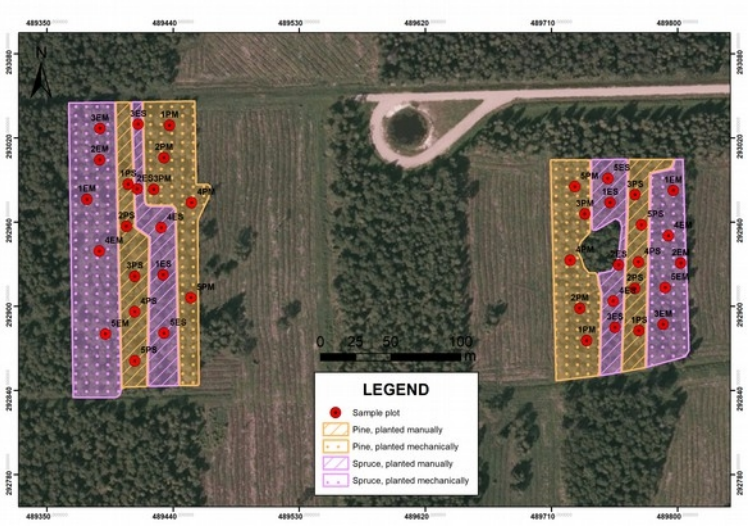
Mechanized planting (2017)

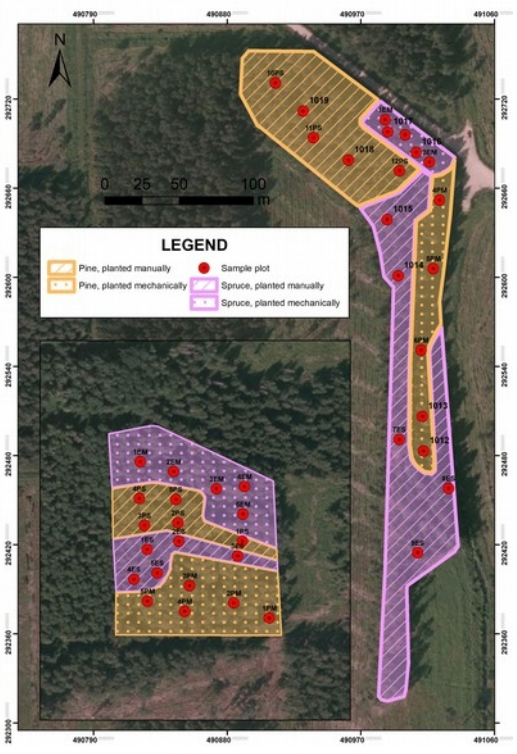
SILAVA

LATVIJAS VALSTS MEŽI

Mechanized planting (2017)



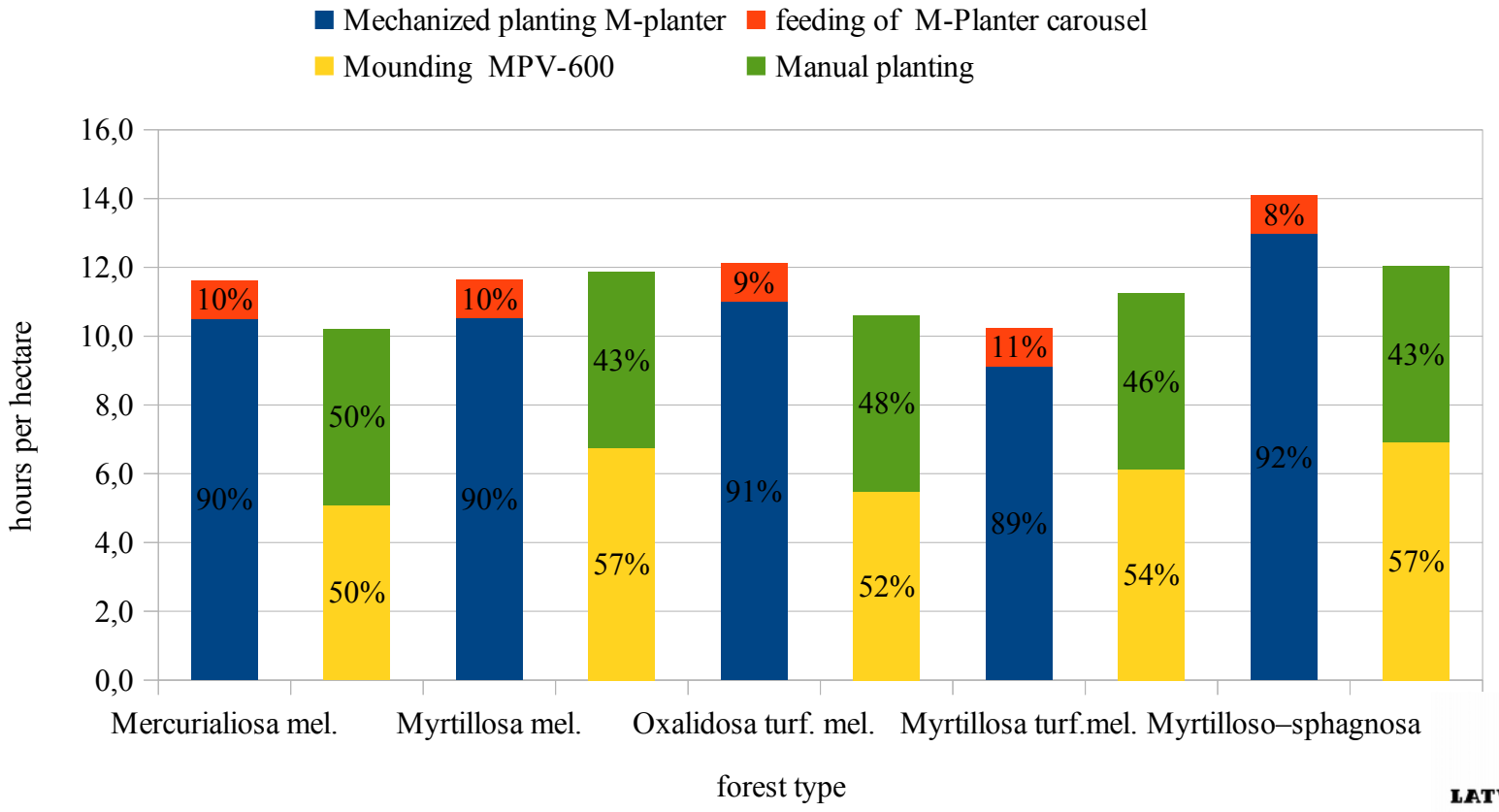




Each of stands is divided into 4 subplots:

- **2 for mechanized planting,**
- **2 for mounding + manual planting.**

Mechanized planting (2017)



Mechanized planting (2017)

Productivity of planting, seedlings per hour	Number of seedlings per ha				
	1600	1800	2000	2200	2400
150	501	563	626	689	751
170	442	497	552	608	663
190	395	445	494	544	593
210	356	402	447	492	537
230	327	368	408	449	490
250	301	338	376	413	451
270	278	313	348	383	417

Mounding
350-400 EUR ha $^{-1}$

Disc Trencing
140-180 EUR ha $^{-1}$

Manual planting
120-160 EUR ha $^{-1}$

Mechanized planting
650-700 EUR ha $^{-1}$

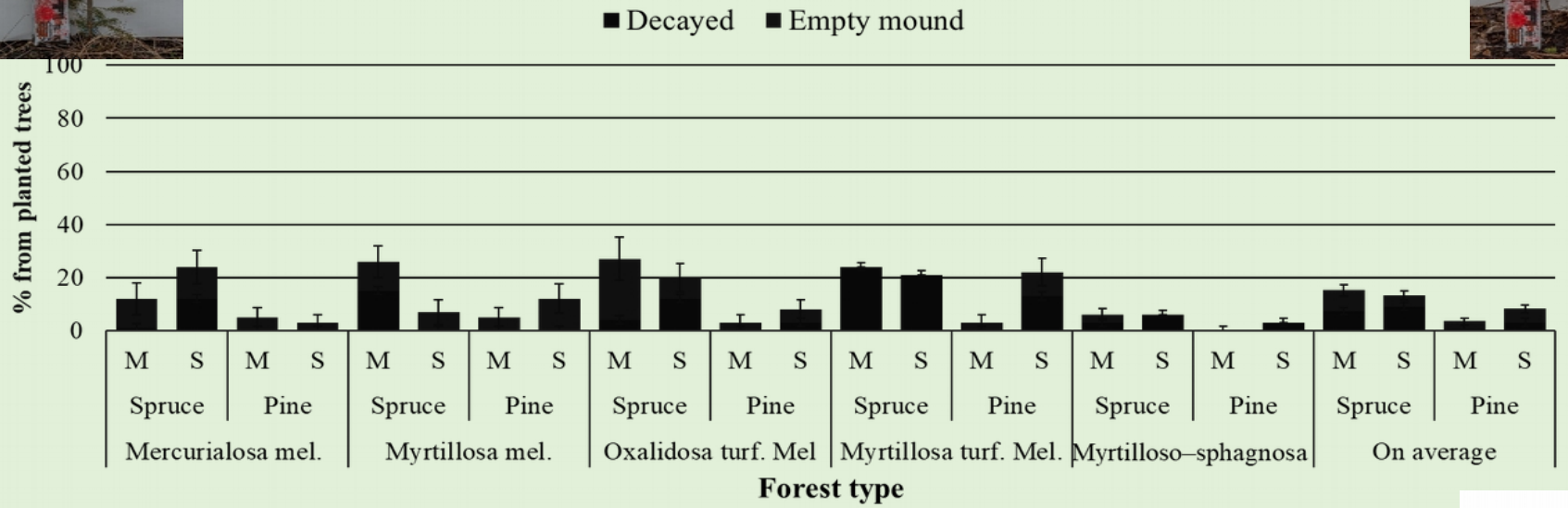
+ Lack of labour
+ Soil preparation

- Short planting season
- Long Payback

Survival rate (%) depending of forest type and planting method used

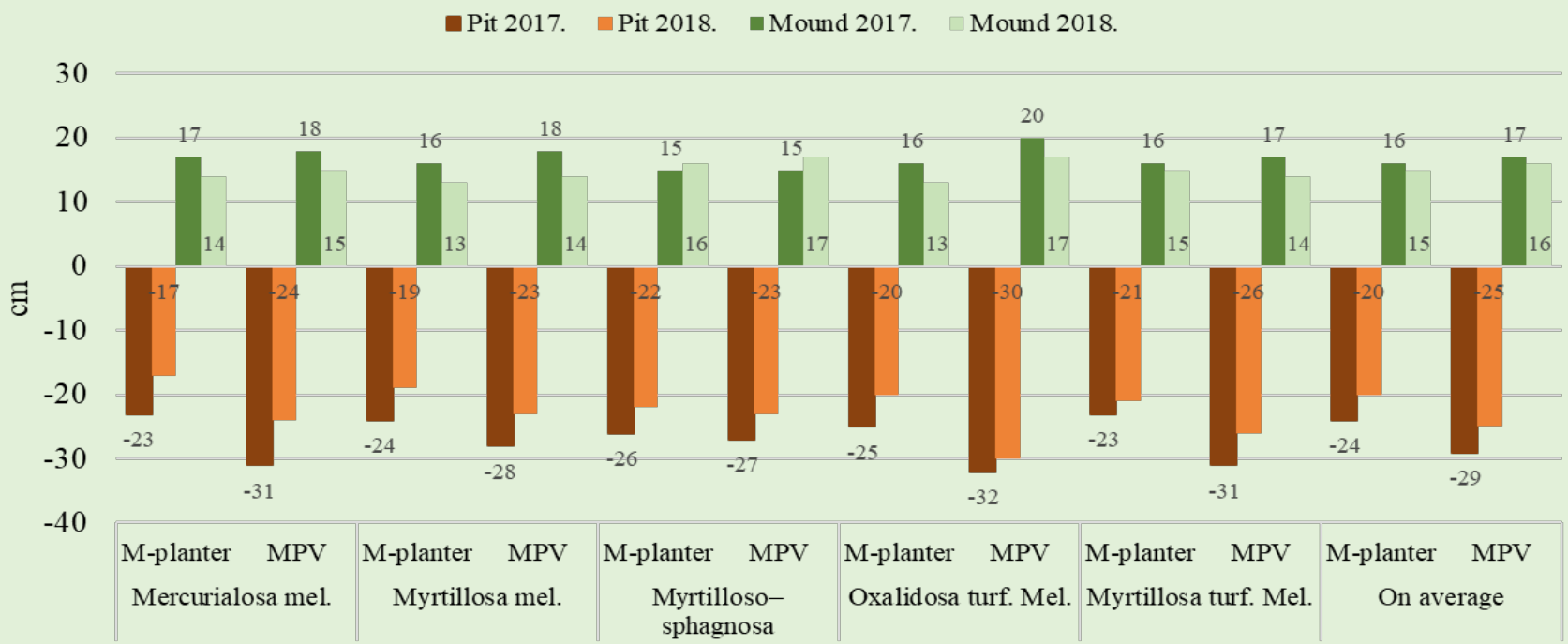
Spruce planted with M-Planter after two growing seasons

Spruce planted manually after two growing seasons



M – M-Planter, S – MPV-600

Pit depth and mound height after first and second growth season



Mechanized planting (2019)

https://
www.lvm.lv/

Recent research activity (2018-19)

- Quality requirements for mounding - ongoing research






Pappers related to topic

- Site preparation method and seedling growth rate.

Forestry Studies | Metsanduslikud Uurimused, Vol. 65, Pages 24–33

DE GRUYTER OPEN

Influence of spot mounding on height growth and tending of Norway spruce: case study in Latvia

Baiba Dzerina, Sigitas Girdziusas, Dagnija Lazdina, Andis Lazdins, Jurģis Jansons, Una Neimane and Āris Jansons*

- Site preparation method and seedling survival.

FORESTRY AND WOOD PROCESSING DOI: 10.22616/rrd.24.2018.008

FOREST REGENERATION QUALITY – FACTORS AFFECTING FIRST YEAR SURVIVAL OF PLANTED TREES

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ENGINEERING FOR RURAL DEVELOPMENT Jelgava, 22.-24.05.2019.

EVALUATION OF FOREST TREE PLANTING MACHINE EFFECTIVENESS

Dagnija Lazdina[1], Karlis Dumins[1,2], Timo Saksa[3], Kristaps Makovskis[1]
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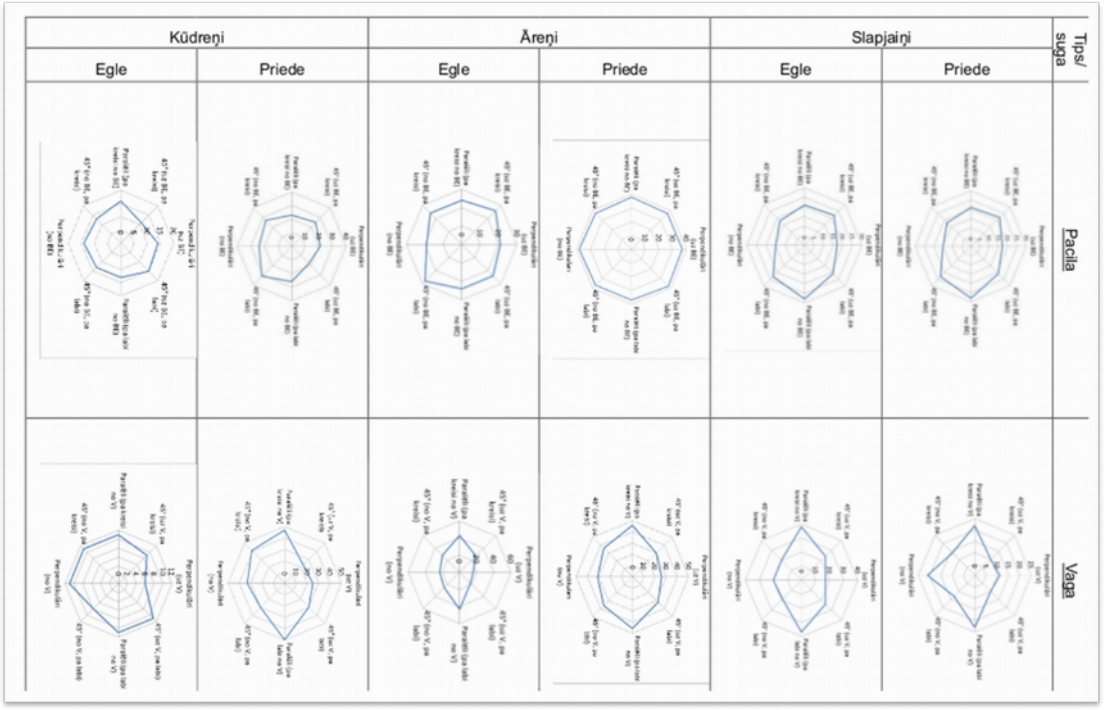
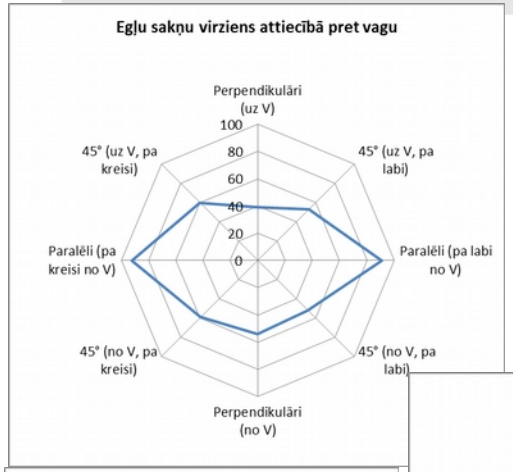
Related publications

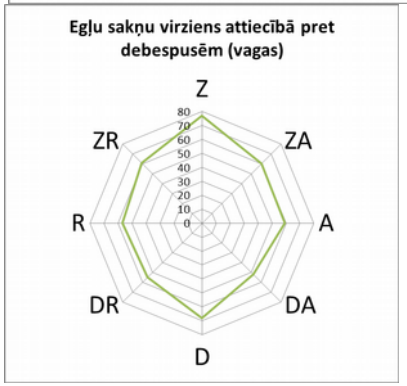
- Site preparation method and early root development

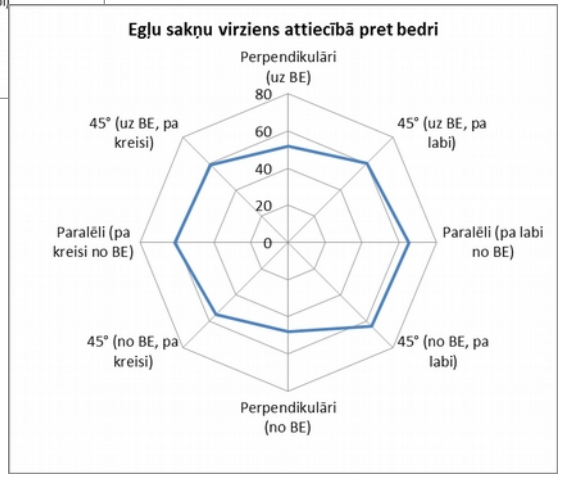


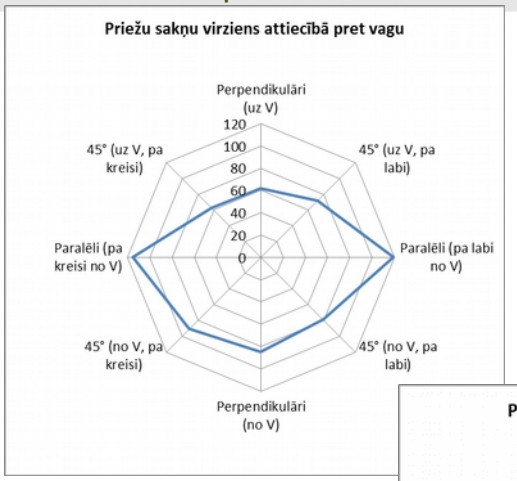
Site preparation method and early root development (Number of records per direction)(Celma 2017)

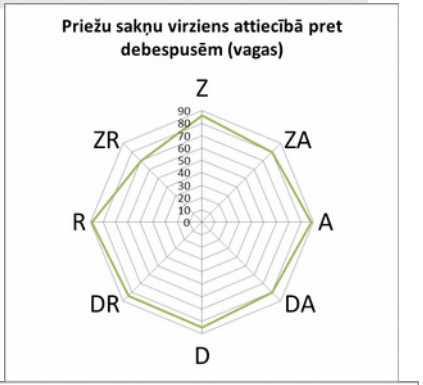
Seedlings planted in trenched sites formed two-sided root system, parallel to the furrow. No correlation between roots growing direction and cardinal points was found.

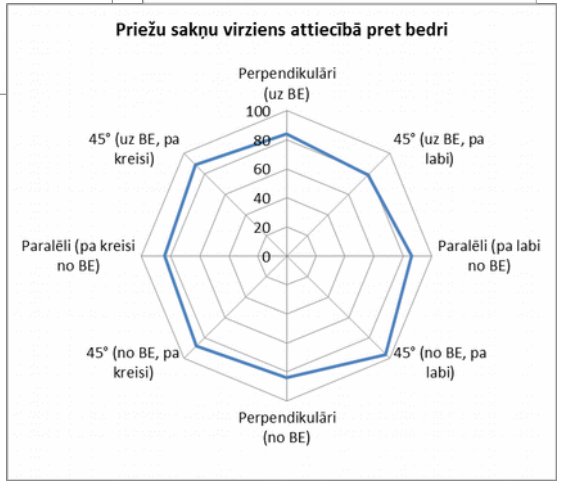












Workshops held

NB NORD workshop & seminar

Forest regeneration mechanization

Latvia, Riga, LSF main office, Vaņodes street 1,2017 May 12

Time schedule

10 00 - 10 15 Arrival and coffe

10 15 - 10 30 Welcome address, Latvian State Forests

Forest regeneration practice:

Mechanization of scarification, planting and cleaning in Nordic and Baltic countrie

10 30 – 11 00 Forest regeneration mechanization practice in Baltic States

Break

11 10 – 1240 Forest regeneration mechanization practice in Nordic countries -Sweden, Norway, Denmark, Finland (

12 40 - 13 00 M-planter – experience and technical details

Drive to forest

Zemgale region forest site lunch and demonstrations

Practical demonstration of mechanized planting with M-planter double and single head

Discussion

Advantages of different scarification methods and requirements for soil preparation result

Registration and other information by email dagnija.lazdina@silava.lv , **please do registration till May 5!**

Improvement of forest trees growth conditions and final felling – operating with big trees!

CAR: NB-NORD Nordic-Baltic Network for Operational Research

Mechanized and improved silviculture workshop

"Small machines for small trees"

November 14-15, 2018

Latvia, Riga & Salaspils& Incukalns

The objective of the workshops is to present ongoing research in Nordic & Baltic countries and to discuss future research needs. Working language is English. The workshop takes place at Riga region. Researchers, master students and PhD-students, as well as people from operational forestry, forest authorities and other forest organizations are welcome for participation in the workshop.

Participants that wants to make a presentation should do registration and send a tentative title to organizers before November 3 (fill the registration form LINK). Registration is open till November 8.

Time schedule

Research result and idea sharing afternoon

November 14 Start with lunch at 12 00

12. 50	**Welcome and opening** (*Riga or Salaspils LSFRI Silava - venue will be selected according to interest of participants*)
13 00	**Topic I**
	Young stand management mechanization practice and challenges
	up to 6 speakers (15 minutes for each country) Questions, short discussion
14.30	**Coffee**
14 45	**Topic II**
	Recent research activities – adaption/ improvement of small machines and new prototypes
	up to 5 speakers(10-15 minutes for each speaker) Questions, short discussion
16.00	**Coffee**
16.15	**Topic III**
	Silviculture mechanization and environment
	up to 5 speakers(10-15 minutes for each speaker) Short discussion
17 30	**Summary of day**
18 00	**Excursion – Riga city – on the way to guest house/ hotel**
20 00	**Dinner**

After the first workshop Bracke P11a is operating in Estonia since 2018

Transfer of technologies to Latvia (2019)

Place for 120 seedlings
is 20 too much
or 80 too less
because
in one box
are 100 seedlings!