

# Rooted shoot cuttings from SE donor plants in Finland – potential material for breeding and propagation

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## Why to produce cuttings from emblings?

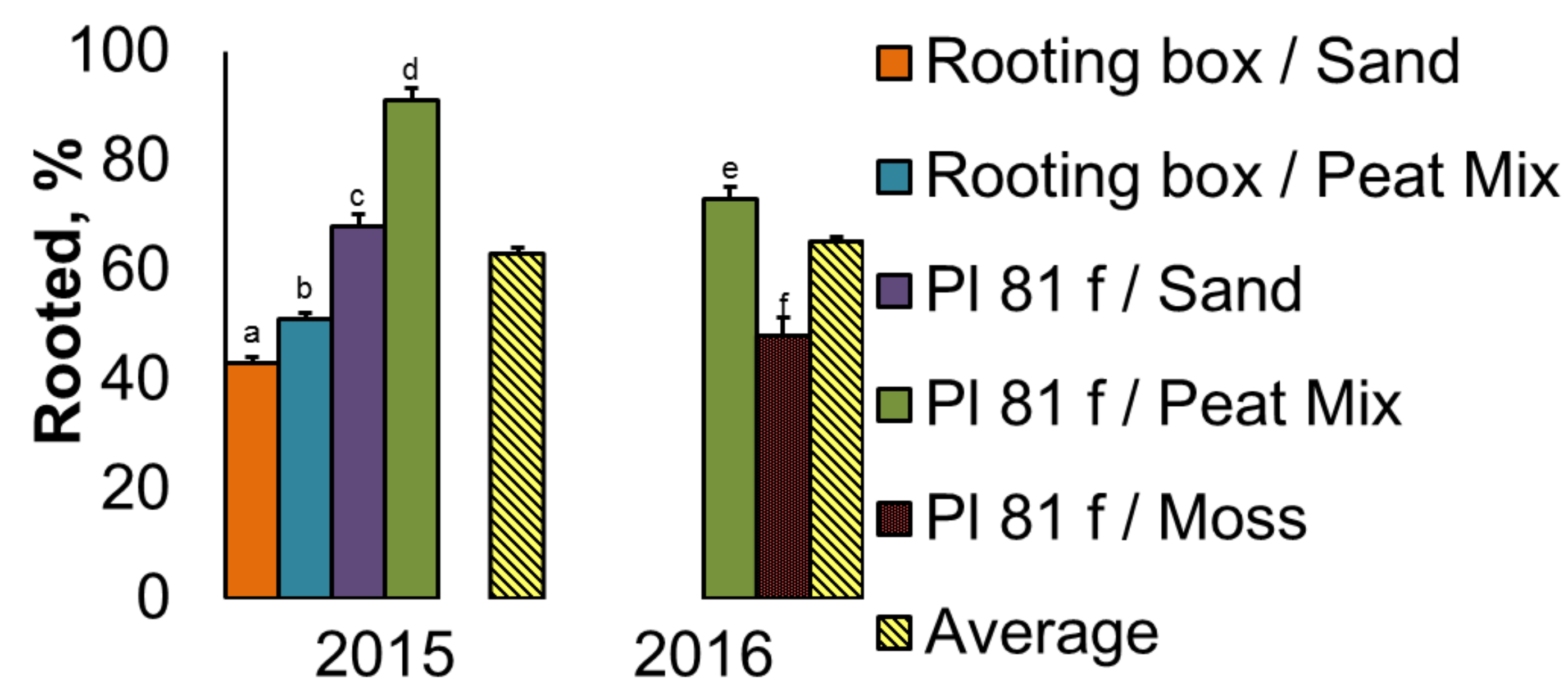
Single field testing cycle of Norway spruce can take up to 3 decades in Finland, and production of test plants takes roughly half of that time.

Somatic embryogenesis (SE) is the most efficient method of vegetative propagation. When combining SE with the state of art cryopreservation, juvenile propagation material is available when the field testing results are available. Relatively small number of emblings from each clone is needed to initiate field testing, if combined with cutting production.

The combination of SE and rooted cuttings has been found profitable for breeding and production with other species. By using vegetative propagules in forest regeneration, breeding results can be implemented more efficiently.

## Will the embling cuttings root?

Cuttings from embling donors root. In two rooting tests carried out in 2015 and 2016 the highest rooting was achieved when growing containers (PI 81 f) were filled with sphagnum peat mixed with vermiculite (2015, 91% rooted) or perlite (2016, 73% rooted) in 3 to 1 ratio. Rooting was observed in all genotypes (34 clones from 11 families) in both years. In both tests dormant cuttings were rooted in spring for 8 weeks, applying heated rooting tables and fogging system.



**Figure 1.** Rooting percentage of Norway spruce shoot cuttings in different rooting vessel and media combinations. The average values with standard errors are shown for data containing all the 34 genotypes tested. Significant differences among the treatments within each test year are marked with differing letters (a-d in 2015 and e-f in 2016).

### Read more:

Tikkinen, M., Varis, S., Peltola, H. & Aronen, T. (2017). Norway spruce emblings as cutting donors for tree breeding and production. *Scan. J. For. Res.*  
<http://dx.doi.org/10.1080/02827581.2017.1349925>



**Figure 2.** Rooted cutting from peat/vermiculite mix from 2015 rooting test (left). Cuttings rooting in sphagnum moss and in peat/perlite mix during 2016 test (right)

## Then what?

With 5 – 12 emblings / clone, sufficient number of cuttings are produced in two growing seasons in the nursery and 2 – 3 years can be saved in test plant production. Using somatic embryo plants directly as test plants, 4 – 5 years can be saved.

Field testing can be initiated with current SE technology combined with cutting production. Elite clones can be selected for production, when the field testing results are available. Meanwhile SE technology can be scaled up into mass production. Commercial production of SE can also be applied in *Parents of family* (class of basic material), with progeny tested parents.



**Figure 3.** One year old Norway spruce embling photographed in autumn 2016.

Leverage from  
the EU  
2014–2020



European Union  
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Development Fund

