



## **Training School - Cost Action CA21157**

### **COPYTREE**

#### **Using robotics for scaling up somatic embryogenesis (17– 18 September, 2025)**

**Address:**

Kasvu1 Technology Platform  
Natural Resources Institute Finland (Luke)  
Production systems / Forest tree breeding  
Vipusenkuja 5  
FI-57200 Savonlinna  
Finland

<https://www.luke.fi/en/research/research-infrastructures/savonlinna-research-infrastructure#kasvu-1-laboratory-for-vegetative-propagation>

<https://www.luke.fi/en/services/production-technology-for-elite-forest-conifers>

**Enrollment Closing**

30 May 2025

**Duration**

2 Days

#### **How automation could be utilized for enhancing applicability of somatic embryogenesis of forest trees?**

One of the main challenges for applying somatic embryogenesis (SE) in forestry is the higher price of SE planting stock compared with the seedlings. The higher costs of planting stock could be balanced by benefits achievable with SE materials, but for the forest owner the planting stock cost is immediate, while the profits are realized much later, at the end of rotation. Thus, the only solution to reach acceptable price level is to improve cost efficiency of SE system by increasing success rate of the most cost-intensive SE steps and by developing technologies to replace manual work. Approaches developed and tested include use of liquid rather than solid cultures, use of robotics and automation for selection and harvest of mature

somatic embryos, followed by automated handling of germination and subsequent planting, or embedding somatic embryos into an artificial seed

Technology has been developed for selection and harvesting of mature somatic embryos. In Canada, robotics is already being used for production of SE planting stock of spruces, with several millions of plants being produced annually. Another example is the SE Fluidics System that handles conifer somatic embryos in liquid, being piloted in Sweden. In Finland, special robotics for machine vision-based selection and picking up, orienting, and placing of conifer somatic embryos for germination has recently been developed. This robot is integrated with AI and works without liquids, being currently tested for scaling-up of Norway spruce SE propagation.

### **What will you learn?**

- Background and a case study on applying robotics for scaling up Norway spruce somatic embryogenesis will be presented
- Invited specialists will share their experiences and discuss factors to be taken into account for:
  - development of SE automation,
  - testing SE robotics with a novel tree species;
- You will gain hands-on experience on using Luke's robotics to pick up and select somatic embryos of:
  - Norway spruce, produced by Luke SE pipeline,
  - participants own materials, representing various tree species;
- Further, you will have a guided visit to Luke SE Technology Platform and SE field experiments

### **Who should apply?**

This training is meant for CopyTree members with a background and interest in applying somatic embryogenesis in tree species. The training itself is free, and participants will be reimbursed for long distance travel expenses and receive a **daily allowance of 150€**.

To apply, please submit a single document that includes your CV and a motivation letter detailing your current research and how you plan to utilize the training in your future studies or work. Be sure to name the document with your first and last name.

### **Invited specialists**

- Elmar Bernhardt (South-Eastern University of Applied Sciences, Finland)
- Jana Krajnakova (Scion, New Zealand)

### **Local organizers and Instructors**

Tuija Aronen, Mikko Tikkinen, Sakari Välimäki, Saila Varis (Natural Resources Institute Finland))

## Participant Number is limited to 6

Participants for the training course will be selected based on several factors, including:

- Quality of the motivation letter and CV: A well written motivation letter that clearly demonstrates your interest in the topic and a CV highlighting relevant experience will be highly valued.
- Priority will be given to applicants having a possibility to bring their own material (mature somatic embryos) to be tested with robots, taking into account plant health regulations (e.g. import of material from species carrying quarantine pests to Finland is not allowed). Further, diversity of tree species will be favored, if possible
- Prior participation in CopyTree Training Schools: Priority will be given to individuals who have not yet attended a CopyTree Training School.
- Career stage: Young researchers and investigators are encouraged to apply.
- Geographic diversity: The selection committee will aim for a diverse group of participants from different regions.
- Gender balance: The selection process will strive for gender parity among participants.

Enroll now in the Training School and join us in an enriching learning experience. We look forward to welcoming you to this remarkable event!

### How to apply:

To apply, please submit a single document that includes your CV and a motivation letter detailing your current research and how you plan to utilize the training in your future studies or work. Be sure to name the document with your first and last name. **The enrollment closes on 30 May.**

You have to apply online at <https://www.copytree.eu/registration-form-training-school-finland>