

Study trip to German forest nurseries

Background

My PhD project is a collaboration between the forest-nursery company Svenska Skogsplantor and the Swedish University of Agricultural Sciences, SLU, and includes a one-year industrial internship at the company. The NordGen Forest scholarship I was granted were used as a part of the internship for a study trip to Germany from the 2nd to the 5th of May 2022. The original plan was to visit a plant production company and forest nurseries in autumn 2021, but the trip was postponed due to situation of the covid19-pandemic. However, the delayed trip gave me the possibility to include a visit to Bayer Crop Science as well.

The trip

The first stop was at Bayer Crop Science in Monheim am Rhein where I was introduced by the forest department to several projects that focus on finding solutions to control pests (mainly insects) and weed associated to forest plants. Bayer Crop Science has a market all over the world and is mainly working on finding new formulations for new products that will have a future on the market. Chemicals that have been proven harmful for the environment/humans, or when targeted pests/weed have increased resistance against them, will eventually become prohibited, and this challenges the company to find new formulations. The whole process of testing, formulating, and receiving approval for a new product takes about 10 years, which includes several trials of a product before it can be used. Some countries, for example France and the Netherlands, have a higher demand on reducing the use of chemical treatments, i.e. insecticides, herbicides and fungicides, which pushes the focus to less harmful methods. The use of electricity, for example, is an alternative method to control weed along railways which is currently under development at Bayer Crop Science. During my days at Bayer Crop Science, I also had the opportunity to visit the formulation lab and I was introduced to the formulation of different product types.

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The second stop was in Oldenburg at the biotechnology company Piccoplant, who produces plants through micropropagation. This process starts *in vitro* by taking an offshoot from a mother plant into a sterile container with a special growth media containing sufficient nutrients. Small plants are then transplanted into soil and further cultivated in several steps before the plants are transplanted into their final pot. With a yearly production of 750 000 lilac plants, this method makes Piccoplant one of the largest lilac producers in the world. Rhododendron, grasses, bamboo and poplar is also produced with micropropagation. Piccoplant has done trials of micropropagation on Norway spruce (*Picea abies*) seedlings, but without any successful result.



Figure 1. Poplar seedlings produced with micropropagation at Piccoplant.

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The last stop was in Rellingen, Schleswig-Holstein, where I met Dr. Heinrich Lösing who works for an association (Versuch- und beratungsring Baumschulen, VuB) that gives advice on forest management strategies to forest nurseries. The association is funded by members and has about 260 forest nurseries with a total of 3000 hectares of production land connected to them. The association has a key-focus on finding and implementing environmentally friendly production processes and has the possibility to test new products or strategies for pest management. A yearly report of trials and results is given to the members, and members are free to contact the association whenever they need. The trip ended with a full-day tour to different forest nurseries around the area. I was guided around by Imke Bunk from Forstbaumschulen Ostermann GmbH who showed me many fields where different forest tree species are cultivated. Compared to Sweden, seedlings in Germany are cultivated directly in the ground as bare-root seedlings. Svenska Skogsplantor are not producing bare-root seedlings by themselves and are therefore having contracts with German nurseries for that assortment.



Figure 2. Seedlings cultivated in Germany for Svenska Skogsplantor.

Summary of the trip

The study trip in Germany has been very valuable for me as I have been in contact with several people who are very experienced in forest seedlings production and that I can contact for future collaborations or exchange of experiences. In Germany, forest seedling producers are facing different challenges in terms of pest management compared to Swedish producers due to the different cultivations systems. Also, approval for fungicides is different between the countries which means that certain compounds can be forbidden in Sweden but allowed in Germany. The visit at Bayer Crop Science gave me insight in how complex and challenging it is to both produce new chemical formulations for pest control, but also to develop alternative products/methods.