Study trip to Sweden for selection and identification of superior ash seed resources

Destructive disease caused by invasive fungus *Hymenoscyphus fraxineus* led to a critical situation of ash population in most of the European countries especially Nordic and Baltic regions. Researchers agree that the only way to save the ash population is breeding of resistant trees. Seed is fundamental to broad scale plant restoration when the goal is to re-establish species and ecosystems. Nordic and Baltic forest geneticists already ten years ago, demonstrated large genotypic variation among native ash trees in their susceptibility to the ash dieback pathogen (see review in McKinney et al 2014). While some advances have also been made towards developing a more resistant population with selected and tested ash trees, coordinated efforts are urgently needed in order to achieve successful reforestation and restoration across the region.

The NordGen scholarship allowed me to participate in the fieldwork where the main aim was assessment and analysis of existing trials and survey of stands to identify truly superior 1st generation genotypes.

Based on 2018 surveys and personal contacts with stakeholders all ash sites (126 in total) have been divided into five main areas across Sweden (Figure 1.). I was participating in the field trip in the 1st area, between July 2 – 13th, 2019. In total 53 sites were inventoried in the south-west part of Sweden, 10 of which were selected additionally during the trip.

Selection and registration of ashes was done by the vitality of trees i.e. trees with a crown having at least 70% leaf coverage. If the crown was >70% leaf coverage but we observe clear indications of other severe dieback symptoms such as many epicormics shoots, root collar lesion or irregular crown, then the tree were skipped. Top pruned trees normally were not selected.

Additionally, other information about the site and trees were registered i.e. description of the location of the tree (stand, alley, pasture, park, nature reserve, courtyard etc.), the number (rough estimation) of ash trees within the site, coordinates, diameter at breast height, height of the tree (rough estimation), the overall stem quality based on straightness, branchiness, forking and whether the tree has seeds. Other comments about the tree or location were also noted.

During the trip, over 150 ash trees were inventoried and assessed according to the requirements mentioned above. We believe this study trip was of high success because all selected trees will be used for a new ash trial establishment.

For me, as an early career researcher, this trip was very useful and provided a knowledge base of ash tree breeding, as well as a lot of valuable information on the selection of the best ash genotypes, screening, and assessment methods. Collaboration with ones of the best forest pathology and breeding specialists helped on my own personal development as a researcher when it comes to creating novel ideas, theoretical and practical knowledge, and gaining new experience with tree breeding.

The activity under this study trip was also mentioned in one personal blog, the link: https://sunebroman.blogspot.com/2019/07/soker-vitala-askar.html

In the meanwhile, we will continue our collaboration with the Nordic countries in further works i.e. planting of progeny trial(s) and test for resistance (as a result - research-tested, potentially resistant material for foresters, practitioners and other interested parties).

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Figure 1. Ash sites around Sweden.