

The Quebec Network for Reforestation and Intensive Silviculture

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The Quebec Network for Reforestation and Intensive Silviculture (QNRIS) contributes to the development of tree planting in forests to increase forest productivity, in urban areas for the development and maintenance of green infrastructures, and on disturbed or anthropized sites for ecological restoration. The QNRIS has three strategic objectives: research and development, knowledge transfer to stakeholders, and networking and partnerships. Activities started in September 2019 and the network was officially launched in January 2020. The QNRIS relies on the expertise and collaboration of 20 researchers from 8 universities and 2 government research centres.

The activities of the QNRIS cover seven complementary themes: (i) growth and yield of plantations, (ii) ecological restoration of disturbed/anthropized sites, (iii) resilient plantations, (iv) phytoremediation and the production of bio-based products, (v) genetic improvement and adaptation, (vi) leverage of residual materials (fertilization) and carbon sequestration, and (vii) wood processing and value chain. QNRIS is planning an annual conference, workshops and training sessions in various Quebec regions. It also uses other knowledge transfer tools, including a website, which brings together relevant information on experimental sites, as well as a newsletter, summaries of relevant scientific articles, inventory of projects, as well as articles in specialized magazines and regional newspapers. QNRIS is also present on social networks. The network aims to be a significant scientific reference for tree plantations in Quebec and Canada, and a leader in developing communication tools that help regional partners meet identified needs with the most recent innovations.

On sex determination in poplars – the discovery of the master switch

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Sexual reproduction is one of the most important processes for almost every form of life: it ensures genetically diverse offspring and therefore the ability to survive in an ever changing environment. Despite this, little is known about sex determining mechanisms in some of our crop and forest species. Just recently, the mechanism of sex determination has been uncovered in poplars. Similar to humans, poplars separate male and female function onto different individuals (dioecy).

Based on modern molecular data (genomic and epigenomic data), a single master regulator for this phenomenon has been identified. It functions likely in hormone signaling, and this master switch is controlled by an intriguing epigenetic mechanism. Subsequent work using genome editing provided functional proof: if the master regulator is inactivated in females, plants produce male flowers leading to a sex change. The discovery of this central regulator now raises interesting questions related to developmental pathways, its relevance in a broader taxonomic context, or the application of this knowledge in silviculture.