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***Kalmia* – conifer interactions in eastern Canada: From allelopathy to satellite imagery**

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In eastern Canada, the ericaceous shrub *Kalmia angustifolia* is recognized to rapidly invade boreal sites following harvesting or wildfire. On some sites, such invasion can induce ecosystem retrogression, as the species induces a “growth check” of naturally established or planted conifers. This shift from once productive forest stands to *Kalmia* heaths has important effects on forest productivity and biodiversity.

The direct and indirect effects of ericaceous shrubs on conifers are mainly related to severe competition for nutrients, allelopathic interactions, and the production of a recalcitrant humus. However, our understanding of the interactions among *Kalmia*, conifers, and site ecological characteristics is not complete. Fine-tuning of our management approaches for invaded or susceptible sites is needed. In the context of ecosystem-based management, the development of preventive silvicultural strategies based on solid ecological grounds remains crucial.

We demonstrated how the extensive root system of *Kalmia* ensures that the species dominates the nutrient uptake processes. We also confirmed that the recalcitrant ericad-humus has striking effects on soil temperature, reducing the energy absorbed by the rooting zone. However, *Kalmia* does not seem to directly influence soil temperature and moisture, or induce water stress to planted seedlings. Ongoing field research will provide further understanding of its effects on conifer physiology and soil microbiology.

A better knowledge of the mechanisms responsible for ericad interferences is needed to develop ecosystem-based silviculture. In boreal Québec, we verified if slow-released fertilizers can alleviate the nutritional issues of various *Kalmia* sites. Indeed, we measured increased early growth responses following fertilization, compared to unfertilized conditions. We also confirmed the efficacy of mechanical scarification to stimulate planted seedling growth. Moreover, site preparation favoured the establishment of early-succession species that were absent from control plots.

We carry further research to explain the distribution and dynamic of ericaceous shrubs at various scales, from the site to the national level, in interaction with forestry activities. We use ecological data from national forest inventories to fine-tune our ecological classification system. We are developing cartographical tools based on satellite imagery to assess ericaceous heath expansion over time. We will use this new knowledge to elaborate succession models that take into account the ‘ericad effect’ on forest regeneration; such models are essential to adequately assess forest productivity, and to the development and implementation of ecosystem-based management.