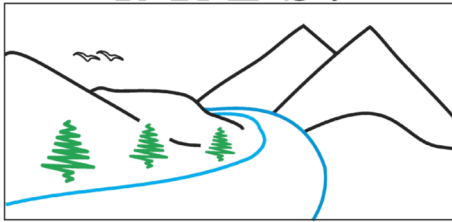


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"Our environment is our future"

## RESEARCH COLLOQUIUM SERIES

### Dr. Paal Krokene

Norwegian Forest and Landscape Institute



**Friday**  
**Sept 25, 2009**

**3:30 - 4:30**

**LECTURE THEATRE**

**7 - 152**

LIGHT REFRESHMENTS  
SERVED AT 3:20 PM

### The role of acquired resistance in conifer-bark beetle-fungus interactions

Tree-killing bark beetles and their fungal associates must deal with the potent anatomical, chemical and molecular defenses of living conifers. These defenses include preformed, constitutive defenses as well as inducible defenses that are upregulated in response to an attack, such as cell wall lignifications and formation of traumatic resin ducts and wound periderms. In addition, local or systemic acquired resistance, which may be considered a long-term consequence of induced defenses, may increase the tree's resistance towards future attacks.

Acquired resistance is elicited by beetle attacks, fungal inoculation, mechanical damage, or treatment with chemical elicitors such as methyl jasmonate (MeJ). Such exposures are priming the trees by acting as stimuli that accelerate, enhance or potentiate tree responses to subsequent challenges. Priming may turn phenotypes that normally would succumb to an attack into highly resistant ones that survive with only minor symptoms. The exact mechanisms responsible for acquired resistance in conifers are not fully understood, but probably involve activation of inducible anatomical defense responses such as changes in polyphenol-containing parenchyma cells (PP cells) in the phloem and induction of traumatic resin duct formation in the sapwood. These responses are paralleled by upregulation of defense-related transcripts and elevated levels of secondary metabolites, including monoterpenes and diterpene resin acids.