

PATTERNS OF COLONIZATION BY BLUE-STAIN FUNGI AND THE IMPACT OF HOST TYPE

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The conifers are an ancient group, extending back about 300 million years and over much of this time it seems likely that they have had to contend with attacks from both bark beetles and fungi. But the huge consumption of conifer lumber (more than 200 million m³ each year in North America and Europe alone) currently demands that the wood is pristine and free from the damage that fungi can inflict. Several factors play a role in making conifer sapwood susceptible to colonization by blue-stain fungi, particularly once it has been felled. Traditionally, emphasis has been placed on the extent to which this is influenced by wood moisture content and prevailing climatic conditions, but more recently the role of chemical defences in conifer bark and wood has come to be recognised as another factor with the potential to influence patterns of fungal colonisation. Field evaluation of five species of conifers – Scots pine, Lodgepole pine, Sitka spruce, Norway spruce and Japanese larch, indicated striking differences in their relative susceptibility to blue-stain, especially in the absence of bark beetle attack. In the most susceptible host: pine, colonization by blue-stain fungi also appeared to be concentrated in a shell around the periphery of recently felled logs, and later breached by slower growing but more combative, penetrating decay fungi. However, the tendency of pine to succumb readily to blue-stain unlike larch and Sitka spruce, did not correlate strongly with any single factor. Both pine species tended to retain moisture in comparison with the other conifers, but no pattern emerged in the nutrient status of the wood from more or less susceptible species. And chemical defences in the form of phenolic compounds could only be detected in wood at very low concentrations, although Sitka spruce showed consistent levels of phenolics up to four months after felling, possibly explaining its resistance to blue-stain in contrast to other conifers species.