

NRESI RESEARCH COLLOQUIUM SERIES

FRIDAY

MAR. 31, 2006

3:30 - 4:30 pm

**ROOM
NUMBER
6-205/211
(Conference Centre)**

**LIGHT
REFRESHMENTS
SERVED AT 3:20 PM**

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Impact of Host Resistance and Density Dependent Host Selection Behavior of Bark Beetles on their Population Dynamics

I will discuss aspects of host plants that affect insect population and host selection behaviors, effects of host plants on insect development and survival, and genetic variation of these traits. We examined the role of population density on host selection behavior of the spruce beetle, *Dendroctonus rufipennis* using field and laboratory experiments on the bark beetles collected from 29 endemic or eruptive populations in Alaska and Utah, USA, and Yukon, Canada. A series of laboratory assays in which host-based media were amended with varying concentrations of phytochemicals identified several factors that underlie population-dependent responses to hosts. I will discuss the above modifications of behaviors and how they might contribute to positive feedback in population dynamics, and discuss linkages between host breadth and population densities in eruptive species. I will conclude with a current project examining host resistance to mountain pine beetle (MPB) (*Dendroctonus ponderosae*). The recent outbreak of MPB in British Columbia, provided an opportunity to examine variation in resistance expressed as antixenosis-host selection and oviposition, antibiosis-defensive response of host which impacts herbivore fitness and tolerance. We examined genetic variation of differential attack and resistance of 2500 20-year old lodgepole pine open-pollinated (OP) family trial individuals from 180 OP parent-tree collections, from several populations. Each tree was scored for several traits relating to MPB attack. All estimates of heritability for differential attack of MPB on lodgepole pine were generally in the range of the heritability of height at age 10 (i.e., $h^2 = 0.45$) indicating there are moderate to high levels of genetic variation for resistance related traits to MPB.