

Researcher looking for way to minimize spread of mountain pine beetle

August 11 2009



Nadir Erbilgin prods a budworm on a jack pine seedling.

Like a human being who, with a compromised immune system, is vulnerable to secondary diseases, jack pine trees ravaged by budworms may be more susceptible to an invasion of mountain pine beetles.

A University of Alberta researcher is receiving almost \$300,000 to explore how to protect Canada's jack pine forests from the mountain pine beetle, which is already laying waste to the country's lodgepole pine

trees.

"Cold climate is basically what has kept the mountain pine beetle out of Alberta forests, and not just Alberta, but also some areas in British Columbia," said Nadir Erbilgin, a Canada Research Chair in Forest Entomology and assistant professor of renewable resources at the U of A. "The pine beetle has a limit of about minus 40 Celsius, but we are now facing global warming, which brings higher temperatures at northern latitudes, so that could change.

In fact, he says, "It is changing."

Erbilgin has been awarded the Alberta Ingenuity New Faculty Award, worth \$299,790. He will investigate the invasion dynamics of the mountain pine beetle in jack pine forests and its interaction with another important forest pest, the jack pine budworm.

"My goal is to determine whether or not trees that have already been attacked by the budworm are going to be highly susceptible to the pine beetle," he said. "If that's the case, we still have some time to do some pre-emptive management. If they are more susceptible, just go and cut down those trees that have been attacked by budworms."

Because the budworm only feeds on the foliage, the timber still has economic value if harvested before a mountain pine beetle outbreak. But a pine beetle infestation stains the wood of the dead tree with a blue tint that makes the tree without value in many international markets.

The funding, given over three years, will help Erbilgin evaluate if prior defoliation of forests by the budworm affects the trees' susceptibility to attack by the mountain pine beetle, and subsequent survival and population growth of the beetle in jack pine forests. His work will also focus on how trees' defensive chemistry is regulated against multiple

invading insects.

The findings could help identify jack pine forests that are at risk of invasion by the mountain pine beetle, so vulnerable trees can be cleared to avoid encouraging population growth of the insect into new areas. The information could also be used to predict where beetles could disperse and successfully establish themselves.

Currently, jack pine forests have not been attacked by the pine beetle, though hybrid forests of lodgepole and jack pine have been invaded.

"Without susceptible trees, the pine beetle can't establish and survive in jack pine forests," Erbilgin said.

Jack pine forests extend east of the Rocky Mountains, all the way from the Northwest Territories to Nova Scotia, and provide the main source for timber industries in Manitoba and Ontario. The jack pine grows further north than any other pine and is the most widely distributed pine species in Canada. The hardy tree is one of the dominant-and ecologically most important-tree species in Alberta, Erbilgin noted.

"They grow in less fertile and drier soils than other pines, so ecologically they are very important tree species in Canada and Alberta."

"The problem of bugs is big. The jack pine is a critical keystone species and it also intermingles with other pine species, like eastern white pine that goes all the way to the southern U.S.," he said, but added that there is time to minimize the spread of mountain pine beetle. "We have time to plan for it. We're not too late."

Alberta Ingenuity's New Faculty Award provides operating funds to researchers who are in their first academic career appointment at an Alberta post-secondary institution. Erbilgin is one of four University of Alberta researchers to receive this award in 2009, along with James

Harynuk, Tian Tang and Michael Woodside.

Source: University of Alberta ([news](#) : [web](#))

Citation: Researcher looking for way to minimize spread of mountain pine beetle (2009, August 11) retrieved 21 September 2024 from <https://phys.org/news/2009-08-minimize-mountain-beetle.html>

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