

Native fungi packs punch

A native fungi with an appetite for consuming pine trees may hold the answer to dealing with the prolific wilding pine problem afflicting New Zealand's landscape. **Richard Rennie** reports.

THE Ministry for Primary Industries estimates 20% of New Zealand's landscape will be covered in wilding pines in 20 years if they are left to spread uncontrolled.

They already cover 1.8 million hectares, the equivalent to two-thirds of the area committed to dairy pasture, and are swallowing 90,000ha of land a year.

Canterbury University Bio-Protection Centre researcher Genevieve Early's research work has found a fungi common to NZ's native bush shows promise as an effective biological control agent that could play a vital part in slowing that spread.

Armillaria novae-zelandiae, known as harore by Maori or

"honey mushroom", feeds on decaying wood in native forests. It can often be seen when tramping, with its distinctive honey colour growing out of stumps in damp areas.

Working with fellow researcher Professor Ian Dickie and colleague Dr John Pirker, Early tested at what age the fungi grew best on pine, ranging from live to freshly harvested to old, decaying wood.

Typically, the mycelium will attack pine trees, and its effects have been well-researched by the commercial forestry sector for decades.

Preventative methods to reduce its effect include clear felling, stump removal and no longer planting exotic forests across the top of indigenous forestation.

Afflicted pine trees will die off over time when infected by the fungi. This ability of a native species to prevent establishment of a non-native species is known as biotic resistance.

"The fact we are introducing an established native fungi as a biological control agent is a slightly different tactic to the usual biological control model, where you look for a pathogen or herbivore from the weed's home habitat and introduce it into a new environment," Early said.

"Some of the questions we have about using Armillaria, for example, are whether we can introduce it to grassland areas that are susceptible to wilding pine invasions, where it doesn't currently exist, and whether introducing it at the same time as pines are felled would prevent reinvasion."

Testing several strains of the mycelium proved A.novae-zelandiae had the best growth and was consistently the most vigorous on live or freshly felled pine.

This was a critical discovery, implying they could design a way to inoculate wilding pine sites with A.novae-zelandiae at the same time the trees were being manually removed and sprayed.

"We are not suggesting this will replace current removal methods, rather it will be another tool used in the process, ensuring that pines don't just reinvade following removal," Dickie said.

"The next step for us is to use direct tests with planted pine



PREVENTING REINVASION: Bio-Protection Centre researcher Genevieve Early with mycelium used to infect wilding pines.



BIOLOGICAL CONTROL: Wilding pines infected by Armillaria novae-zelandiae in North Canterbury.

seedlings and natives, to ensure it is only the pines that are killed, as well as trialling different application methods."

The researchers can see the potential to inoculate sterilised wood chips and spread these around sites once conventional treatment and removal has taken place. This will cut down on having to revisit the sites, which are often remote and expensive to access.

Overseas similar prevention methods have even involved shooting inoculant coated shotgun shells into stumps, something they doubt will be adopted here.

"We also want to find out if inoculating the sites will accelerate decomposition and reduce wildfire risks," he said.

There is also a doubly strong indigenous link to using the native fungi on an exotic pest.

A.novae-zelandiae was a food source used by Maori and the researchers appreciate the value it may play in also helping iwi

as a biological control to reduce wilding pine numbers on their land.

The research could also provide a pathway to develop other native fungi for use as biological controls, with early work indicating some that grow on native tawa also inhabit exotic species.

The group is seeking funding to continue the research, looking at how A.novae-zelandiae affects native seedlings, and testing if it could be used to clear pines in areas where ecological restoration was planned.

Funding for Early's research has come through the Bio-Protection Research Centre at Lincoln and the Winning Against the Wildings project funded through MBIE.

"Until now we have been good at killing pines, but not at restoring ecosystems. We are winning the battles but losing the war," Dickie said.

"This fungus may be the key to not just killing pine, but to keeping it from reinvading and for restoring ecosystems."

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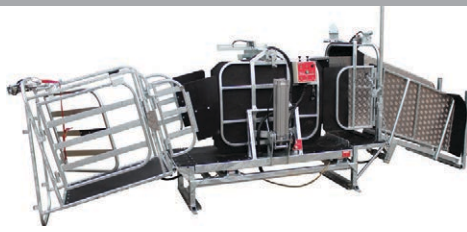
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