

Study uses pine slash to improve soil

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Te Whare Wānanga o Waitaha | University of Canterbury Master's student Mingyuan (Kathy) Liu has been investigating how pine slash could be used to help rehabilitate silt-covered soils. She uses rhizoboxes made with two glass panels to monitor the growth of plant roots. Credit: University of Canterbury

Pine slash—a major problem after recent flooding events—could be chipped and used to rehabilitate soil, new research from the University

of Canterbury and ESR suggests.

University of Canterbury Master's student Mingyuan (Kathy) Liu has been investigating the use of pine waste mixed with urea fertilizer on silt-covered soils from Canterbury and Gisborne. She has found that combining pine waste with urea is the most effective for plant growth, compared to urea alone, or using compost or other organic matter on the soils.

Liu says with flooding becoming increasingly common, and pine slash—a [waste product](#) from commercial forestry that can be dislodged by moving water—causing issues, this study indicates there's a real opportunity to use one challenging waste problem, pine slash—to fix another—silt-covered soils.

"We've looked at blending pine waste into finer sawdust particles and mixing them with the [soil](#) and some fertilizer to make the soil more porous—better for water drainage and for plants to grow," Liu says. The results in a campus greenhouse show a large increase in [soil fertility](#), and she says field testing is now required.

In the study, [oats](#) were planted in the soil which had been treated with pine sawdust and fertilizer. Oats are a popular green manure that improve soil texture and increase soil organic matter.

"Oats are really helpful for stabilization of the soil structure," Liu says. "We could immediately see the difference in the crops grown in pine sawdust mixed into the soil."



Credit: University of Canterbury

Liu's Supervisor UC Science Professor Brett Robinson says preliminary results are exciting.

"Pine slash is a current issue facing New Zealand and the rest of the world. To date, we know of no other reports detailing the rehabilitation of flood-deposited sediment using pine [waste](#). We hope to take it to the next stage—field testing—soon," he says.

This work would be conducted in collaboration with Dr. Maria Jesus Gutierrez-Gines, a science leader at ESR (Institute of Environmental Science and Research) who has co-supervised Liu's research. ESR has

supported the research to date by providing technical time and analysis and organizing the delivery of sediment from flood-affected Gisborne.

Professor Robinson says [pine](#) contains substances that are known to inhibit [plant growth](#), but when applied in the trials to work on the structure of sediment or silt, it created the capacity for the soil to retain nutrients.

"Essentially it acts like a sponge and breaks down to humus which is beneficial to the soil."

Provided by University of Canterbury

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