securing hill country with the right poplar and willow trees.

- Farming hill country can be harsh; the land’s stability is at the whim of Mother Nature. Even mild storms cause erosion, harming pastoral productivity, producing flooding and polluting waterways. But there is a solution.

The Poplar and Willow Research Trust undertakes extensive research and breeding programmes to grow the most effective poplars and willows for preventing erosion. Working with Local Government and valued commercial partners, we then help farmers select and plant the right trees for their area. The securing properties of poplar and willow trees, we think, makes them NZ’s humble, unsung, Hill Country Heroes.

Comparison of secured and unsecured hill country following the July 2015 Whanganui storm.
it’s all about topsoil.

- Topsoil – the top six inches – holds the highest concentration of nutrients. Without it, little plant life is possible.

  When pastoral topsoil erodes, it takes those vital nutrients with it, leaving the land less productive. And it takes more than a farmer’s lifetime to build that productivity back up again.

  When pastoral soil run-off enters our waterways it elevates the levels of nitrogen and phosphorus, harming the quality of the water and the life dependent on it.

  But, through planting the right poplar and willow trees, we can stabilise our hill country and keep that valuable topsoil in place.
“Planting poplars and willows on erodible hill country is a no brainer – it’s my insurance for being able to carry on business when severe weather events occur, and they seem to be getting more frequent.”

PETER GAWITH
WAIRARAPA FARMER

“Without the soil conservation plantings of poplars and willows giving protection in erosion-prone areas, this farm would be another green desert on the coast.”

JAMES HUNTER
RANGITOTO FARMER

“The impact of climate change and concern about water quality means I’ll be planting more poplars and willows to protect my farm.”

TONY PEARSE
OTAGO FARMER

“Planting poplars and willows is a key land management option for hill country farmers. Beef+Lamb New Zealand supports the work of the Trust in providing independent technical information to assist farmers in land management. Information from the Trust is delivered to farmers at Beef+Lamb New Zealand field days and workshops, alongside other farm sustainability tools like the LEP toolkit (Land & Environment Planning toolkit).”

BEEF+LAMB NEW ZEALAND

“Ensuring we have the best genetic material available is vital for our regional erosion control programmes. This gives us and our farmer clients the confidence to invest in poplars and willows for erosion control.”

DAVID CAMERON, LAND MANAGER - GREATER WELLESLEY REGIONAL COUNCIL

“The damage to Hawke’s Bay’s hill country after Cyclone Bola was extensive, with some farmers choosing to exit and sell to forestry. Here on ‘Trelinnoe’ we stepped up our planting programme to better protect our hills from future events like Bola. Today we have some 7,000 poplars and willows. Several weeks ago we had 420mls of rain over a few days with only a small handful of slips - a stunning display of the trees’ effectiveness in stabilising our vulnerable hillsides. When you add the additional benefits of shade, shelter, drought feed and amenity, I’m left wondering why more of these trees aren’t being planted.”

BRUCE WILLS
HAWKE’S BAY FARMER
our mission:
getting the right tree in the ground
to retain highly productive pasture
and clean waterways.

To deter erosion and improve water quality through sediment reduction, a complementary relationship between trees and pasture is needed on 700,000ha of NZ’s pastoral hill country. Our extensive poplar and willow research is focussed on realising our vision through providing effective and viable tree solutions for farmers.
our research

breeding programme

Our breeding programme, based in Palmerston North, creates tailored poplar and willow seedlings to test in field trials.

We maintain a national archive of poplar and willow species, providing the genetic material for developing new and improved cultivars. Controlled crosses are made and seedlings are raised in root trainers. After one season they’re planted in open ground, and for the next two years, we evaluate their phenology, disease resistance, branch angle, stem form, brittleness and plant vigour. The best seedlings are then selected for field trials.

field trials

We monitor the field trial plantings for 15 years to evaluate survival, growth and compatibility with grazing stock and pests. We also examine water-use efficiency, rooting capability, ease of propagation, tolerance to wind and drought, and wood properties. Our field trials take place in a wide range of soil and climatic conditions, and planting on farms is wide-spaced to simulate erosion control plantings on pastoral hill country.

The occasion of severe rain events allows us to measure the stabilising effect of poplar and willow species, tree spacing, and size. Current research is investigating how tree root development on slopes varies with age, soil type and pollarding management.

pest management

Fortunately, poplars and willows are exposed to a low number of diseases and pests in NZ. Fungal rust diseases are the most significant, affecting tree vigour and health.

Poplar rust arrived in NZ in the 1970s, willow sawfly in the 1990s, and giant willow aphid in the 2010s. Other pests could be a threat in future. So our research also develops strategies for minimising the impact of pests and diseases through cultivar selection and management.

sharing results

Using results of our extensive research, we provide an advisory service to Regional Councils, and support users through our website (www.poplarandwillow.org.nz), publications, and speaking at field days and workshops.
other benefits of poplars & willows

- Provides shade for stock, which can improve growth rates and reduce losses.
- Animal growth setbacks during droughts can be managed by feeding trimmings from poplar and willow trees.
- Prevents costly damage to infrastructure from slips.
- Improved farm aesthetics.
- Contributes to bird corridors.
- Willow pollen is the dominant protein source for bee colonies in spring, which are key for agricultural and horticultural crop growth.
- Willow roots on the edges of streams provide valuable habitat for eels.
- Slowing run-off lessens river peak flows and flooding.
our partnerships

regional council sponsors
Regional Councils appoint the Chair and provide representatives from their Land Managers and River Managers groups. A council advisory group including council nursery managers also provides input into and reviews our research.

corporate sponsor
The role of the Poplar & Willow Research Trust is an important part of Beef+Lamb New Zealand’s Land Environment Plans, which they’re rolling out to support sheep and beef farmers around the country.

research partners
We work with the following research partners on projects that promote knowledge and applications of poplars and willows: tree management; responses to environmental change; soil stabilisation effectiveness; willows for bees and stock fodder; education activities.

education partner
Our scientists work with Massey University on joint research projects. We also provide support and supervision for their post-graduate programmes.
our trustees

Our Trustees represent the interests of Regional Councils in land and river management, and the pastoral and horticultural interests of NZ’s primary production sector.

bruce wills
Bruce farms ‘Trelinnoe’, a Hawke’s Bay hill-country sheep and beef farm with a strong environmental sustainability focus. Trelinnoe won the Hawke’s Bay Farm Environmental Award in 2008 and also supports the internationally-recognised garden, ‘Trelinnoe Park’. Prior to taking up farming, Bruce spent 20 years in banking and investments. Bruce holds a wide range of off-farm governance positions and is a past National President of Federated Farmers.

peter kemp
Peter is Professor of Pasture Science and Head of the Institute of Agriculture and Environment at Massey University. He supervises postgraduate research on silvopastoral systems based on poplar and willow, and is on the Board of the Bio-Protection Research Centre.

stephanie sloan
Stephanie is currently employed by PGG Wrightson as the Technical Specialist in Soil Science for the North Island. Stephanie comes to PGG Wrightson after working as a nutrient management specialist for Ravensdown. Having grown up on her family sheep and beef farm in Wairarapa, she completed her Bachelor of Science degree in Otago, continuing on to complete a postgraduate degree in AgriScience at Massey University. Stephanie has worked on Poplar & Willow projects with Plant & Food Research for a number of years, with a Poplar trial currently on her family farm.

garth eyles
Garth spent 29 years in soil conservation research and 15 years in sustainable land use applications as Manager of Land Management for the Hawke’s Bay Regional Council. Garth now consults professionals and land managers in sustainable land management practices. A life member of the NZ Association of Resource Management, he received the Green Ribbon Award for Sustainable Land Use in 2009, and the Hawke’s Bay Environmental Award in 2008.

tom mandeno
Tom runs a sheep and beef farm at Waikaretu, north of Raglan. A Nuffield Farming Scholar, Winston Churchill Fellow and Justice of the Peace for NZ, Tom also has governance experience as a Director of Meat & Wool NZ (2004-09), a Director of the NZ Wool Board and a Director of the NZ Meat Board. He’s currently an appointed member of the Environment Waikato West Coast Zone sub-committee, and a Director of the C. Alma Baker Trust (NZ) Ltd Limestone Downs.

trevor freeman
Environmental Services manager with Gisborne District Council, Trevor represents the land management officers of the Regional Councils. He has 35 years’ experience in soil conservation policy development, regulation, works, advocacy and education.

noel hinton
Noel represents the National Regional Councils River Managers’ Forum on the Trust. He is Catchment Manager for Environment Southland with eight years’ civil engineering construction experience (roading and power development), and 32 years’ experience in flood protection scheme design, implementation and maintenance, river management and land drainage service delivery programmes.
our staff

General Manager
& Lead Scientist
ian mcivor M.Sc.
Ian manages the poplar and willow breeding programme, and researches root behaviour and responses to environmental conditions on hill slopes. Ian heads the National Poplar Commission, represents New Zealand on the International Poplar Commission (IPC), and chairs the IPC Working Party on Poplar and Willow Genetics, Conservation and Improvement.

Scientist
Trevor jones PhD
Trevor researches poplar and willow water use and wood properties. Trevor has expertise in assessments of old and new tree trials.

Business Manager
Allan frazer
As well as being our business manager, Allan is also the business manager for The Ahuwhenua Trophy – BNZ Māori Excellence in Farming Awards, Deputy Chairman of the NZ Woolclassers Association, a former marketing manager for Meat and Wool NZ and an olive farmer.

Associate Scientists

John Charles
(Plant & Food Research)
– specialises in insect pests and is the Vice-Chairperson of the IPC Working Party on Poplar Insect & other Animal Pests

Dr. Brent Clothier
(Plant & Food Research)
– specialises in soils and stakeholders

Dr. Grant Douglas
(AgResearch)
– specialises in the effectiveness of conservation trees and on-farm applications of poplars and willows

Dr. Alec Mackay
(AgResearch)
– specialises in soil quality and soil carbon

Dr. Mike Marden
(Landcare Research)
– specialises in erosion and erosion management

Dr. Chris Phillips
(Landcare Research)
– specialises in root development

Scientist
Trevor Jones PhD

Business Manager
Allan Frazer
Recognising soil erosion as a major concern for New Zealand, the Soil Conservation and Rivers Control Act was passed to reduce the extent and risk of soil erosion. Public Works Department and Ministry of Works and Development undertook applied research through demonstration farms.

National Plant Materials Centre (NPMC) established at Aokautere near Palmerston North to centralise national breeding programmes.

Native tree alternatives tested but none had similar growth rates or could grow in the presence of grazing animals. Poplars and willows still proved to be the most effective and versatile.

Ministry of Agriculture and Forestry (MAF) established the Hill Country Erosion Fund to support projects to decrease pastoral, hill country erosion. The continued development of poplars and willows was a key component, with $175,000 per annum provided for four years on the condition that councils provide a similar amount and work to create a self-sustaining funding model.

International review identified poplars and willows as the best species for managing erosion in the presence of grazing animals. Superior clones were released in NZ. Improved nursery management techniques meant poles could be supplied to farmers in bulk.

NPoMC incorporated into the Aokautere Science Centre, tasked with researching wider soil conservation management techniques. A significant portion of their budget was dedicated to poplar and willow breeding.

NPoMC disestablished and breeding programmes were transferred to the newly established HortResearch Crown Research Institute (CRI) in Palmerston North. With funding under threat, “survival” funding was provided by a group of Regional and Unitary Councils and the goodwill of the host CRI, who recognised the need for continued development of poplars and willows. Heavy storms continued to plague pastoral hill country, where 700,000 ha remained unprotected.

Council committee established the Poplar and Willow Research Trust, based at Plant & Food Research at Massey University, Palmerston North. The key objective of the Trust is to secure funding for continued poplar and willow research and promotion, to protect NZ’s 500,000ha of remaining at-risk pastoral hill country. To date, we’ve been funded through research grants, Regional Council subscription, pole levies, and our valued corporate partner, Beef+Lamb New Zealand.
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